

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-187794

(43)Date of publication of application : 04.07.2000

(51)Int.CI.

G08G 1/005
 B42D 15/10
 G06K 17/00
 G06K 19/07
 G06K 19/00
 G08G 1/13
 G09B 29/00
 H04Q 7/34

(21)Application number : 10-364409

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(22)Date of filing : 22.12.1998

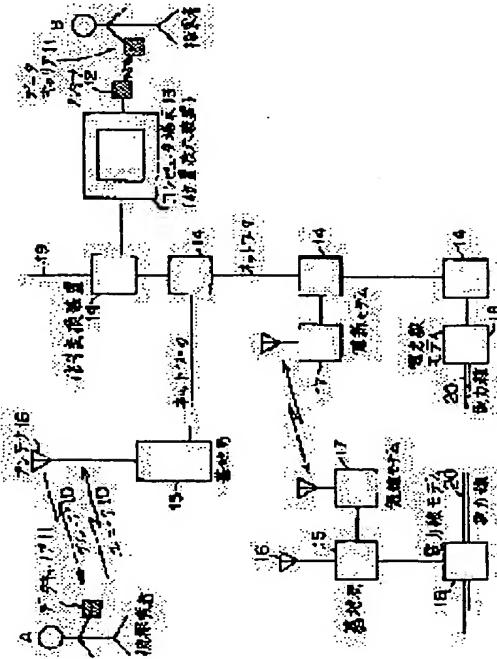
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(54) METHOD AND SYSTEM FOR SEARCHING GROUP MEMBER

(57)Abstract:

PROBLEM TO BE SOLVED: To search whereabouts of a person, who entered an institution, with easy operation.

SOLUTION: When a searcher B brings a data carrier 11 close to an antenna 12 for the purpose of finding whereabouts of a search object person A belonging to the same group, a terminal 13 reads a unique ID of this data carrier 11 and extracts a corresponding group ID. A base station 15 broadcasts the group ID in the institution and receives a response from the data carrier 11 of the search object person A having a unique ID including the same group ID. Position information of the base station 15 which received the response is displayed on the screen of the terminal 13 as the search result.



LEGAL STATUS

[Date of request for examination] 19.12.2003

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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CLAIMS

[Claim(s)]

[Claim 1] The retrieval system characterized by having a storage means to relate the identification information of two or more data carriers belonging to one group with this group, and to memorize it, and a retrieval means to search the location of other data carriers and to output a retrieval result based on the identification information of one data carrier in said two or more data carriers.

[Claim 2] Said storage means is a retrieval system according to claim 1 characterized by including said two or more data carriers which have said group's identification information.

[Claim 3] Said storage means is a retrieval system according to claim 1 characterized by including a database means to associate mutually the identification information of two or more of said data carriers, and to store it.

[Claim 4] as for said retrieval means, said one data carrier was brought close — detecting — this — the retrieval system according to claim 1 characterized by including a reader means to read the identification information of one data carrier automatically.

[Claim 5] Said retrieval means to the data carrier which is in the location which can communicate among said two or more data carriers The data carrier which received these data from this base station means including one or more base station means to transmit some [at least] data of the identification information of the data carrier for retrieval The retrieval system according to claim 1 characterized by answering this base station means in the this held identification information when the received data are in agreement with a part of identification information [at least] which the data carrier which this received holds.

[Claim 6] Said retrieval means is a retrieval system according to claim 5 characterized by including a display means to display the area corresponding to the base station means which received identification information from the data carrier in the location in which said communication is possible among said one or more base station means as said retrieval result.

[Claim 7]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the retrieval system which looks for the visitor [the whereabouts] no longer understanding in area decided beforehand, such as an amusement park (amusement park) and a trade fair site, and its approach.

[0002]

[Description of the Prior Art] An amusement park, a trade fair site, a department store, a museum, an art gallery, etc. are very difficult for many visitors discovering a specific visitor in the facility which comes in at once because of confusion. For this reason, for example, from parents, from a prodigal child and an organization, in order to look for those prodigal etc., many efforts are required.

[0003] The whereabouts of the visitor in such a facility is managed and there is "a whereabouts managerial system in a facility" (JP,7-56991,A) as a Prior art for looking for illusion people. By this system, the data carrier was given to each visitor and the path which the visitor moved is managed by reading that ID (identifier) at the gate prepared in the facility. Here, a data carrier means the equipment which memorizes data with an electric component and communicates data by non-contact.

[0004] If illusion people's inquiry occurs, it will supervise whether the person who specified ID of a data carrier from the name, and had a corresponding data carrier passes a system at each gate.

[0005] However, by such system, the whereabouts takes the remarkable latency time for the illusion people who are searched to pass through one of the gates to retrieval rather than is clear. Moreover, retrieval is very difficult when moving without illusion people passing through any gate.

[0006] Furthermore, in order to match and manage a visitor's personal name and ID of a data carrier, it is necessary to register all visitors' name beforehand, and the time and effort for the input is required. Exact retrieval is not performed, if it is necessary to input the name and the same name as the time of registration is not inputted, also in case illusion people's inquiry is performed. For this reason, at the time of entrance, an input of a name takes careful cautions.

[0007] The technical problem of this invention is offering the retrieval system which can receive many visitors by comparatively easy actuation, and can search a searcher's-ed whereabouts location easily, and its approach.

[0008]

[Means for Solving the Problem] Drawing 1 is the principle Fig. of the retrieval system of this invention. The retrieval system of drawing 1 is equipped with the retrieval means 1 and the storage means 2, and includes the 1st and 2nd principles of this invention.

[0009] In the retrieval system by the 1st principle, the storage means 2 relates the identification information of two or more data carriers belonging to one group with the group, and memorizes it. Based on the identification information of one data carrier in two or more above-mentioned data carriers, the retrieval means 1 searches the location of other data carriers, and outputs a retrieval result.

[0010] A data carrier is possessed by each visitor, such as a facility, and can answer a letter in the data which answer a signal from the outside and are held. The data carrier of two or more visitors belonging to a specific group is managed as one group by the storage means 2.

[0011] As a storage means 2, the case where those data carrier itself is used, and the case where a database is used can be considered. In the case of the former, a group's identification information common to the data carrier belonging to the same group is written in each data carrier. Moreover, in the case of the latter, the identification information of the data carrier belonging to the same group is associated mutually, and it stores it in the database.

[0012] From the searcher who is looking for a group's constituent, if the identification information of the data carrier is inputted into the retrieval means 1, it specifies the group who corresponds with reference to the information on the storage means 2 based on it. And the current position of other data carriers belonging to the group is searched, and the acquired positional information is outputted as a searcher's-ed whereabouts location.

[0013] For example, when a group's identification information is written in each data carrier, the retrieval means 1 is broadcast from many base stations in a facility of searcher's group's identification information. And the positional information of the base station which received the reply of the identification information is outputted as a retrieval result.

[0014] Moreover, when group management is performed by the database, the retrieval means 1 broadcasts the identification information of the data carrier belonging to the same group as a searcher from a base station. And the

positional information of the base station which received the reply of the identification information is outputted as a retrieval result.

[0015] It becomes unnecessary thus, to input a searcher's-ed name etc. at the time of retrieval by associating mutually of two or more same visitors' of a group's data carrier, and managing it. Moreover, the identification information of a searcher's data carrier can be easily inputted by non-contact. Therefore, it becomes possible to only search easily bringing a data carrier close to the sensor part of the retrieval means 1 for a searcher's-ed whereabouts location. Furthermore, an input of a name can be excluded at the time of reception of a visitor, and reception processing of a visitor is simplified.

[0016] Moreover, in the retrieval system by the 2nd principle, the storage means 2 associates the identification information of the data carrier which a searcher possesses, and the identification information of the data carrier which a searcher-ed possesses, and is memorized. Based on the identification information of the above-mentioned searcher's data carrier, the retrieval means 1 searches the location of the above-mentioned searcher's-ed data carrier, and outputs a retrieval result.

[0017] Also in this retrieval system, the case where those data carrier itself is used, and the case where a database is used can be considered as a storage means 2. In the case of the former, the identification information common to a searcher's data carrier and a searcher's-ed data carrier is written in each data carrier. Moreover, in the case of the latter, the identification information of a searcher's data carrier and the identification information of a searcher's-ed data carrier are associated mutually, and it stores them in the database.

[0018] If the identification information of the data carrier is inputted into the retrieval means 1 from a searcher, it specifies the identification information of the data carrier of the searcher-ed who corresponds with reference to the information on the storage means 2 based on it. And the current position of the data carrier is searched and the acquired positional information is outputted as a searcher's-ed whereabouts location.

[0019] Thus, the actuation at the time of reception of a visitor and retrieval becomes easy like the retrieval system of the 1st principle by associating the data carrier of a searcher and a searcher-ed mutually, and managing it.

[0020] For example, the retrieval means 1 of drawing 1 corresponds to the terminal 13 of drawing 2 mentioned later, a base station 15, a network 19, etc., and the storage means 2 corresponds to the data carrier 11 or database 26 of drawing 3.

[0021]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail, referring to a drawing.

[0022] In the retrieval system of an operation gestalt, common group ID is assigned to the data carrier of the visitor who comes in into two or more persons' group like a family or a class. When a certain group member in one group searches for other group members, the whereabouts location of all the group members of the others which belong to the same group automatically is displayed only by bringing a data carrier close to the position read out device. prepared in the facility.

[0023] Thus, by associating the searcher and the searcher-ed by specific ID beforehand, it becomes unnecessary to input a searcher's-ed name, and retrieval of illusion people becomes easy.

[0024] Drawing 2 is the retrieval structure-of-a-system Fig. of an operation gestalt. As well as the data carrier 11 of the wireless type possessed by the visitor of facilities, such as an amusement park, and two or more computer terminals 13 for retrieval inquiries installed by being scattered in the facility, it is [the retrieval system of drawing 2] scattered, it is installed in a facility, and it includes two or more base stations 15 with ID of a proper. A data carrier 11 can communicate with the antenna 12 connected to the terminal 13, and the antenna 16 of a base station 15.

[0025] It connects with a network 19 through a signal converter 14, and a terminal 13 has a function as a position read out device. It connects with a network 19 through a signal converter 14, or a network 19 and communication of a base station 15 are attained through the wireless modem 17. The power-line modem 18 supplies the power from the power line 20 to a base station 15 or a network 19. A signal converter 14 is equipment which performs data conversion required for the communication link on a network 19, and is equivalent to a transceiver in the Local Area Network (LAN) environment using Ethernet.

[0026] As a communication configuration of a data carrier 11, there are an electromagnetic coupling type, an optical communication type, a microwave method, an electromagnetic induction type, etc., and it is decided according to an application any are adopted. Here, a communication range is considered that comparatively long microwave method and electromagnetic induction type are desirable. There are a data carrier without a cell and a thing with a built-in cell in a microwave method, and, generally the data carrier of a communication range with a built-in cell is longer. In a thing with a built-in cell, an accessible distance amounts to several m or dozens of meters.

[0027] An issue-of-banknotes system as shown in drawing 3 is installed in the window which publishes admission tickets, such as an inlet port of a facility. A data carrier 11 has structure convenient to attach to carrying or the body, and has the configuration of small or a card mold. With this operation gestalt, such a data carrier 11 is made to publish to a visitor as an admission ticket.

[0028] The issue-of-banknotes system of drawing 3 contains a terminal unit 21, the server computer 25, and the database 26 that accompanies a server 25. The terminal unit 21 and the server 25 are connected to the network 19 through the signal converter 14. Including an antenna 22, a control section 23, a client computer 24, and a camera 27, read data in a data carrier 11, data are written in a data carrier 11, or a terminal unit 21 has the function to carry out.

[0029] By paying an admission fee, those who enter a facility receive loan of a data carrier 11, and return it in the case of leaving. A server 25 generates unique ID for every visitor based on the request from a client 24 in the case of issue of a data carrier 11. And a client 24 writes ID received from the server 25 in a data carrier 11 by non-contact through a control section 23 and an antenna 22. A database 26 saves ID [finishing / issue]. Moreover, a camera 27 can photo a visitor's image if needed.

[0030] Here, ID recorded on the data carrier 11 which a visitor possesses consists of 32-bit data. As group's constituent's management method, there are an approach of writing group ID in data carrier 11 self and a method of managing group ID by the server 25.

[0031] 24 bits of high orders are made in the case of the former, to be set to unique ID to each visitor as a whole among ID of a data carrier 11, using the group ID section and 8 bits of low order as a personal ID section, as shown in drawing 4. This data carrier 11 considers that that signal is a group alerting signal, when all the personal ID sections of ID signal received to the inquiry by the electric wave from the outside are 0. And if the group ID section of the ID signal is in agreement with the group ID of a data carrier 11, it will return whole ID of a data carrier 11 by wireless.

[0032] Moreover, in the case of the latter, as shown in drawing 5, using 32-bit whole unique ID as a visitor individual's ID, a server 25 relates unique ID of the visitor belonging to the same group with one group ID, and stores it in a database 26. Drawing 6 shows the example of the table stored in a database 26 at this time. If unique ID of this data carrier 11 in received ID signal and a data carrier corresponds to the inquiry by the electric wave from the outside, it will return that unique ID by wireless.

[0033] It is necessary to rewrite group ID by the approach of writing group ID in a data carrier 11 according to a new visitor. For this reason, the data carrier in which read/write is possible must be used. On the other hand, it is not necessary to change unique ID of a data carrier 11 by the approach of saving group ID in a database 26. For this reason, a read-only data carrier may be used and, thereby, cost can be reduced.

[0034] Now, in drawing 2. Visitors A and B should belong to the same group, and B should look for the whereabouts location of A. In this case, by bringing the data carrier 11 to possess close to the antenna 12 of a terminal 13, Searcher B is non-contact and inputs ID of a data carrier 11 into a terminal 13. The antenna 12 has played the role of the sensor which detects a data carrier 11, and the role of the reader which reads the data recorded there. Moreover, unique ID of the type of drawing 4 shall be used here.

[0035] Next, all the bits of the personal ID section are set to 0 among inputted unique ID, and unique ID which left only the group ID section as it was broadcast on radio in a facility from a base station 15. The data carrier 11 which the searcher A-ed possesses will answer the nearby base station 15 in unique ID currently recorded on the data carrier 11, if broadcast of the group ID of the group to whom he belongs is detected. Thereby, a base station 15 recognizes that the data carrier 11 received group ID.

[0036] The base station 15 which received the searcher's A-ed unique ID passes the ID information on a network 19 with the base station ID of a base station 15. On the screen of a terminal 13, the area it is decided that will be a meaning is displayed as the searcher's A-ed whereabouts location from the base station ID of the base station which received unique ID. Thereby, Searcher B can recognize the current position of A in a facility promptly.

[0037] According to such a retrieval approach, the whereabouts location of all the constituents of a group including a searcher will be searched in fact, and it will be displayed. For example, Visitors A, B, C, and D shall constitute one group, those personal ID is set to 1, 2, 3, and 4, respectively, and group ID is set to 1. In this case, unique ID of A, B, C, and D is set to 11, 12, 13, and 14, respectively.

[0038] And if B asks a terminal 13 the whereabouts of A when B, C, and D are in the same location, as shown in drawing 7, 12, 13, and 14 which are unique ID of B, C, and D will be displayed on the same area in a facility, and only 11 which is unique ID of A will be displayed on different area. In this way, B can check the whereabouts of A.

[0039] Moreover, when unique ID of A, B, C, and D is set to 1, 2, 3, and 4 using unique ID of the type of drawing 5, respectively, a screen like drawing 8 is displayed similarly. Also in this case, 2, 3, and 4 which are unique ID of B, C, and D are displayed on the same area in a facility, and only 1 which is unique ID of A is displayed on different area.

[0040] Next, actuation of the system in the case of writing group ID in a data carrier 11 is explained to a detail, referring to from drawing 9 to drawing 14.

[0041] Drawing 9 is the flow chart of the issue-of-banknotes processing by the terminal unit 21 of drawing 3. At the time of the issue of banknotes, first, an operator inputs a group's number N into a client 24 (step S1), and a client 24 requests issue of unique ID of N person from a server 25 (step S2). And a judgment is repeated until it judges and (step S3) publishes whether ID was published or not from a server 25.

[0042] At this time, a server 25 has the the same group ID section, and publishes unique ID of N individual from which only the personal ID section differs, respectively. If ID is published, an operator will write them in the data carrier 11 of N individual one by one (step S4), and will end processing.

[0043] Next, drawing 10 is the operation flow chart of a data carrier 11. Whenever the data carrier 11 is supervising whether the signal was received from the exterior (step S11) and receives a signal, it judges whether it is a number (ID inquiry number) for it to ask ID currently recorded in the data carrier 11 (step S12). Here, in case ID inquiry number means specific unique ID all of 32 bits were beforehand decided to be like 0 and the terminal 13 of drawing 2 asks ID of Searcher's B data carrier 11, it is transmitted from an antenna 12.

[0044] If an input signal is ID inquiry number, a data carrier 11 will transmit unique ID currently held (step S13), and will return to actuation of step S11. Moreover, if it is not ID inquiry number next, it will judge whether the group ID section of ID signal and the group ID section of data carrier 11 self which received are in agreement (step S14). If

they are in agreement, unique ID currently held is transmitted (step S13), and it returns to actuation of step S11, and unique ID will not be transmitted if not in agreement.

[0045] According to actuation of drawing 10, a data carrier 11 transmits unique ID, only when the group ID of the group to whom ID inquiry number or its data carrier belongs is received. Therefore, it is not answered while the base station 15 is broadcasting other groups' group ID. Thus, since a data carrier 11 is not sent unless the need for retrieval arises, it can attain small electrification and a miniaturization of a data carrier 11.

[0046] Next, drawing 11 and drawing 12 are the flow charts of the retrieval processing by the terminal 13 and base station 15 of drawing 2. A terminal 13 sets the control variable T showing a searcher's-ed count of a call with 0 first (drawing 11, step S21), and judges whether the searcher brought the data carrier 11 close based on the signal from an antenna 12 (step S22). And a judgment is repeated when a data carrier 11 is not detected.

[0047] If a data carrier 11 is detected, through an antenna 12, above-mentioned ID inquiry number will be transmitted (step S23), and it will judge whether unique ID was received from a searcher's data carrier 11 (step S24). And a judgment is repeated when unique ID is not received.

[0048] If unique ID is received, it will be regarded as what was able to ask the whereabouts of a group member from the searcher. And the personal ID section is set to 0, unique ID which left only the group ID section is generated (step S25), and it is made to transmit from each base station 15 (step S26).

[0049] Each base station 15 can communicate with the data carrier 11 in the wireless area (base station area) of about 10 meters of radius numbers. And if there is a data carrier 11 which has the same group ID as the group ID which transmitted in the area, unique ID will be received from the data carrier 11.

[0050] Next, a terminal 13 judges whether all the base stations 15 returned the retrieval result (step S27), and if there is a base station 15 to which the result is not returned, it will repeat a judgment. Here, each base station 15 returns a retrieval result to a terminal 13 with the base station ID. And if all the base stations 15 return a retrieval result, it will judge whether the terminal 13 received unique ID from a searcher's-ed data carrier 11 in one of the base stations 15 (step S28).

[0051] Since a searcher's unique ID is already understood, if unique ID in which one of the base stations 15 differs from it is received for example, it will be judged with what received a searcher's-ed unique ID. If neither of the base stations 15 has received a searcher's-ed unique ID next, it compares with the set point T0 which was able to determine T beforehand (step S29). And if T is T0 or less, it will set with T=T+1 (step S30), and a re-call of a searcher-ed will be performed at step S26.

[0052] And if T exceeds T0 at step S29, the message "it was not able to discover in retrieval area" will be displayed (step S31), and processing will be ended. Here, retrieval area means the field covered by all the base stations 15.

[0053] When a searcher's-ed unique ID is received in one of the base stations 15 next, it judges whether two or more base stations have received unique ID (drawing 12, step S32). Unique ID which the base station 15 which received unique ID received with the base station area where the base station 15 covers at the time only of one is displayed (step S33), and processing is ended. The information on the base station area of each base station 15 is beforehand related with the base station ID, and is stored in the terminal 13.

[0054] Moreover, it judges whether when there are two or more base stations 15 which received unique ID next, unique ID with two or more same base stations 15 is received (step S34). When two or more base stations 15 have not received one unique ID, the base station area of each base station 15 and unique ID which received are displayed (step S35), and processing is ended. Moreover, when two or more base stations 15 have received one unique ID, the duplication part and unique ID of the base station area of those base stations 15 are displayed (step S36), and processing is ended.

[0055] For example, as shown to drawing 13 by the circle, each base station area in a facility is arranged so that adjoining base station area may overlap mutually, and covers all the fields in a facility of the electric wave from a base station.

[0056] When the searcher A-ed is detected in the base station which makes base station area 31 the detection range, it turns out that A is in area 31. Moreover, when A is detected even in the base station which makes base station area 32 the detection range at coincidence, the location of A is limited into the area 33 which overlaps both area 31 and the area 32. Then, this duplication part 33 is displayed on a screen as a retrieval result.

[0057] A searcher's-ed whereabouts area is limited and the detection precision increases, so that similarly the number of the base stations to detect increases. In the case of drawing 14, A is detected in three base stations which make the detection range base station area 31, 32, and 34, respectively, and the area 35 which is the duplication part of those area is displayed as a retrieval result.

[0058] Next, actuation of the system in the case of managing group ID by the server 25, without writing in a data carrier 11 is explained to a detail, referring to from drawing 15 to drawing 18.

[0059] Drawing 15 is the flow chart of the issue-of-banknotes processing by the terminal unit 21 of drawing 3. At the time of the issue of banknotes, a client 24 sets the control variable m showing the number [finishing / processing] with 0 first (step S41), and an operator inputs unique ID of a data carrier 11 into a client 24 from an antenna 22, after inputting a group's number N into a client 24 (step S42) (step S43). As for the value of m, the increment only of 1 is carried out at this time.

[0060] Next, a client 24 judges whether m was compared with N and unique ID of all the data carriers 11 that should be registered as a group was inputted (step S44). And if m is smaller than N, the message which asks for the input of unique ID of the following data carrier 11 will be displayed, and processing of step S43 will be repeated.

[0061] And if m reaches N, a client 24 will request group registration of unique ID of inputted N individual from a

server 25 (step S45). And it judges whether the completion of registration was notified from the server 25 (step S46), and a judgment is repeated until it is completed.

[0062] At this time, a server 25 relates with one group ID unique ID of N individual received from the client 24, as shown in drawing 6, it stores it in a database 26, and performs group registration of a data carrier 11. And in response to delivery and it, a client 24 ends processing for the notice of the completion of group registration to a client 24.

[0063] Next, drawing 16 is the operation flow chart of a data carrier 11. If the data carrier 11 is supervising whether the signal was always received from the exterior (step S51) and receives a signal, it will judge whether it is the above-mentioned ID inquiry number (step S52).

[0064] If an input signal is ID inquiry number, a data carrier 11 will transmit unique ID currently held (step S53), and will return to actuation of step S51. Moreover, if it is not ID inquiry number next, it will judge whether unique ID of ID signal and data carrier 11 self which received is in agreement (step S54). If they are in agreement, unique ID currently held is transmitted (step S53), and it returns to actuation of step S51, and unique ID will not be transmitted if not in agreement.

[0065] According to actuation of drawing 16, a data carrier 11 transmits unique ID, only when unique ID which ID inquiry number or its data carrier holds is received. Therefore, it is not answered while the base station 15 is broadcasting other unique ID.

[0066] Next, drawing 17 and drawing 18 are the flow charts of the retrieval processing by the terminal 13 and base station 15 of drawing 2. A terminal 13 judges first whether the searcher brought the data carrier 11 close based on the signal from an antenna 12 (drawing 17, step S60). And a judgment is repeated when a data carrier 11 is not detected.

[0067] If a data carrier 11 is detected, through an antenna 12, above-mentioned ID inquiry number will be transmitted (step S61), and it will judge whether unique ID was received from a searcher's data carrier 11 (step S62). And a judgment is repeated when unique ID is not received.

[0068] If unique ID is received, it will be regarded as what was able to ask the whereabouts of a group member from the searcher. And a database 26 is searched by using a searcher's unique ID as a search key, and searcher's group's number N and unique ID of all the group's constituents are acquired (step S63). Here, ID (n) is stored in buffer [within a terminal 13] A (n) when the n-th constituent's unique ID is set to ID (n), and (n= 1, 2 and 3, ..., N).

[0069] Next, a terminal 13 sets with 1 the control variable n which identifies buffer A (n) (step S64), sets the control variable T showing the count of a call with 0 (step S65), and makes unique ID currently held at A (n) transmit from each base station 15 (step S66).

[0070] If each base station 15 has the data carrier 11 which has the same ID as unique ID which transmitted in the base station area, it will receive unique ID from the data carrier 11.

[0071] Next, a terminal 13 judges whether all the base stations 15 returned the retrieval result (step S67), and if there is a base station 15 to which the result is not returned, it will repeat a judgment. Here, each base station 15 returns a retrieval result to a terminal 13 with the base station ID. And if all the base stations 15 return a retrieval result, it will judge whether the terminal 13 received the same unique ID as A (n) in one of the base stations 15 (step S68).

[0072] If neither of the base stations 15 has received the unique ID next, it compares with the set point T0 which was able to determine T beforehand (step S69). And if T is T0 or less, it will set with T=T +1 (step S70), and a re-call of a searcher-ed will be performed at step S66.

[0073] When unique ID is received in one of the base stations 15, it judges whether the base station ID of all the received base stations 15 was written in buffer B (n) (step S71), n was compared with N, and all unique ID of A (n) was broadcast (drawing 18, step S73). If n is smaller than N, only 1 will increment the value of n (step S74), and the processing after step S65 will be repeated. If T exceeds T0 at step S69, 0 will be written in buffer B (n) (step S72), and the processing after step S73 will be repeated.

[0074] If n reaches N at step S73 next, n will be again set with 1 (step S75), and it will judge whether two or more base stations ID are written in buffer B (n) (step S76). If two or more base stations ID are in B (n), those base stations will regard it as what received ID (n), and will display the duplication part of the base station area of those base stations, and ID (n) (step S77). The information on the base station area of each base station is beforehand related with the base station ID, and is stored in the terminal 13.

[0075] And it judges whether n was compared with N and all ID (n) was displayed (step S78). If n is smaller than N, only 1 will increment the value of n (step S79), and the processing after step S76 will be repeated.

[0076] It judges whether if there is no base station ID of the plurality [B / (n)] in step S76 next, 0 is written in B (n) (step S80), when the value of B (n) does not come out zero and only one base station ID is written in, the base station area of the base station and ID (n) are displayed (step S81), and processing after step S78 is performed.

[0077] Moreover, if the value of B (n) is 0, the message "ID (n) was not able to be discovered" will be displayed (step S82), and processing after step S78 will be performed. And processing will be ended if n reaches N at step S78.

[0078] It is also possible to display the name of the group member for which it was searched on the screen of a terminal 13 as an application of an operation gestalt explained above. For example, when the data carrier 11 of drawing 4 is used, an operator inputs the name of the possessor of each data carrier 11 into the client 24 of drawing 3 at the time of the issue of banknotes. And as shown in drawing 19, a server 25 generates the table which associated the name, the group ID, and personal ID of each group member, and stores it in the database 26.

[0079] At the time of retrieval, the terminal 13 of drawing 2 displays a name [/ instead of unique ID which searched the database 26 and received in steps S33, S35, and S36 of drawing 12]. In the case of the retrieval result shown in drawing 7, a screen like drawing 20 is displayed by using the name stored in the table of drawing 19. Thereby, Searcher B can recognize the searcher's A-ed location more clearly. Here, A, B, C, and D express the name of the group member which sets 11, 12, 13, and 14 to unique ID, respectively.

[0080] Moreover, it is also possible to display the image of a group member for which it looked on the screen of a terminal 13 as other applications. In this case, at the time of the issue of banknotes, a visitor's consent is obtained, and the camera 27 of drawing 3 takes that photograph of his face etc., and inputs into a client 24. And a server 25 stores the images 41, 42, 43, and 44 of each group member in a database 26, as shown in drawing 21. Moreover, the table which associated the pointer, the group ID, and personal ID which point out the storing field of those images is generated, and it is stored in the database 26.

[0081] At the time of retrieval, the terminal 13 of drawing 2 displays an image [/ instead of unique ID which searched the database 26 and received in steps S33, S35, and S36 of drawing 12]. In the case of the retrieval result shown in drawing 7, a screen like drawing 22 is displayed by using the pointer stored in the table of drawing 21. Thereby, Searcher B can recognize the searcher's A-ed location more clearly. Here, images 41, 42, 43, and 44 express the photograph of his face of the group member which sets 11, 12, 13, and 14 to unique ID, respectively.

[0082] According to the approach of displaying an image on the screen of a retrieval result, since an operator does not need to input a name, rather than the approach of displaying a name, the efficiency of issue-of-banknotes processing is increased, and a data carrier 11 can be promptly published also in group of a lot of people. Moreover, also when the data carrier 11 of drawing 5 is used, a name and an image can be displayed by generating the same table as drawing 19 or drawing 21.

[0083] Moreover, in this operation gestalt, those who have been behind from after can also be added to the same group as the person who already came in by rewriting the group ID of a data carrier 11, or rewriting the table of a database 26. Furthermore, it is also possible to charge the costs generated in facilities, such as a toll of an attraction, for every group ID, and to liquidate them per group at the time of leaving.

[0084] As the terminal 13 of drawing 2, the client 24 of drawing 3, and a server 25, an information processor (computer) as shown in drawing 23 is used, for example. The information processor of drawing 23 is equipped with CPU51, memory 52, an input unit 53, an output unit 54, external storage 55, the medium driving gear 56, and network connection equipment 57, and they are mutually connected by the bus 58.

[0085] The program and data which are used for processing are stored in memory 52. As memory 52, ROM (read only memory), RAM (random access memory), etc. are used, for example. CPU51 performs each processing of a retrieval system which was mentioned above by performing a program using memory 52.

[0086] Input devices 53 are a keyboard, a pointing device, a touch panel, etc., and are used for required directions or an informational input. Output units 54 are a display, a printer, etc. and output the inquiry matter to a retrieval result or an operator.

[0087] External storage 55 is a magnetic disk drive, an optical disk unit, magneto-optic-disk (magneto-optical disk) equipment, etc. An above-mentioned program and data are saved at this external storage 55, and it can also be used if needed, being able to load them to memory 52.

[0088] The medium driving gear 56 drives the portable record medium 59, and accesses the contents of record. As a portable record medium 59, record media which arbitration can computer read, such as a memory card, a floppy (trademark) disk, CD-ROM (compact disk read only memory), an optical disk, and a magneto-optic disk, are used. An above-mentioned program and data are stored in this portable record medium 59, and it can also be used if needed, being able to load them to memory 52.

[0089] Network connection equipment 57 communicates with external equipment through the network (circuit) 19 of arbitration, such as LAN (local area network). Thereby, they can also be used for memory 52 if needed, being able to load an above-mentioned program and data to reception from external equipment, and loading.

[0090] Drawing 24 shows the record medium which can supply a program and data and in which computer reading is possible to the information processor of drawing 23. The program and data which were saved in the portable record medium 59 or the external database 60 are loaded to memory 52. And CPU51 performs the program using the data, and performs required processing. Moreover, the external storage 55 of drawing 23 and the database 60 of drawing 24 are used as a database 26 of drawing 3.

[0091] Moreover, drawing 25 shows the example of a configuration of a data carrier 11. The data carrier of drawing 25 includes an antenna 61, a control section 62, the storage section 63, and a power supply section 64. An antenna 61 transmits and receives a signal between external antennas, and the storage section 63 memorizes unique ID like drawing 4 or drawing 5. A control section 62 controls the communication link by the antenna 61, and performs read/write of the data to the storage section 63. Moreover, a power supply section 64 supplies a power source to an antenna 61, a control section 62, and the storage section 63.

[0092]

[Effect of the Invention] According to this invention, a searcher and a searcher-ed are beforehand associated by managing the visitor of facilities, such as an amusement park, per group. At the time of retrieval of the same group's constituent, actuation is simplified that what is necessary is just to bring a data carrier close to the sensor part of a system. Moreover, issue-of-banknotes processing can be substituted for comparatively easy actuation also by a lot of people's group's case.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the retrieval system which looks for the visitor [the whereabouts] no longer understanding in area decided beforehand, such as an amusement park (amusement park) and a trade fair site, and its approach.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, a searcher and a searcher-ed are beforehand associated by managing the visitor of facilities, such as an amusement park, per group. At the time of retrieval of the same group's constituent, actuation is simplified that what is necessary is just to bring a data carrier close to the sensor part of a system. Moreover, issue-of-banknotes processing can be substituted for comparatively easy actuation also by a lot of people's group's case.

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TECHNICAL PROBLEM

[Description of the Prior Art] An amusement park, a trade fair site, a department store, a museum, an art gallery, etc. are very difficult for many visitors discovering a specific visitor in the facility which comes in at once because of confusion. For this reason, for example, from parents, from a prodigal child and an organization, in order to look for those prodigal etc., many efforts are required.

[0003] The whereabouts of the visitor in such a facility is managed and there is "a whereabouts managerial system in a facility" (JP,7-56991,A) as a Prior art for looking for illusion people. By this system, the data carrier was given to each visitor and the path which the visitor moved is managed by reading that ID (identifier) at the gate prepared in the facility. Here, a data carrier means the equipment which memorizes data with an electric component and communicates data by non-contact.

[0004] If illusion people's inquiry occurs, it will supervise whether the person who specified ID of a data carrier from the name, and had a corresponding data carrier passes a system at each gate.

[0005] However, by such system, the whereabouts takes the remarkable latency time for the illusion people who are searchers-ed to pass through one of the gates to retrieval rather than is clear. Moreover, retrieval is very difficult when moving without illusion people passing through any gate.

[0006] Furthermore, in order to match and manage a visitor's personal name and ID of a data carrier, it is necessary to register all visitors' name beforehand, and the time and effort for the input is required. Exact retrieval is not performed, if it is necessary to input the name and the same name as the time of registration is not inputted, also in case illusion people's inquiry is performed. For this reason, at the time of entrance, an input of a name takes careful cautions.

[0007] The technical problem of this invention is offering the retrieval system which can receive many visitors by comparatively easy actuation, and can search a searcher's-ed whereabouts location easily, and its approach.

[Translation done.]

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MEANS

[Means for Solving the Problem] Drawing 1 is the principle Fig. of the retrieval system of this invention. The retrieval system of drawing 1 is equipped with the retrieval means 1 and the storage means 2, and includes the 1st and 2nd principles of this invention.

[0009] In the retrieval system by the 1st principle, the storage means 2 relates the identification information of two or more data carriers belonging to one group with the group, and memorizes it. Based on the identification information of one data carrier in two or more above-mentioned data carriers, the retrieval means 1 searches the location of other data carriers, and outputs a retrieval result.

[0010] A data carrier is possessed by each visitor, such as a facility, and can answer a letter in the data which answer a signal from the outside and are held. The data carrier of two or more visitors belonging to a specific group is managed as one group by the storage means 2.

[0011] As a storage means 2, the case where those data carrier itself is used, and the case where a database is used can be considered. In the case of the former, a group's identification information common to the data carrier belonging to the same group is written in each data carrier. Moreover, in the case of the latter, the identification information of the data carrier belonging to the same group is associated mutually, and it stores it in the database.

[0012] From the searcher who is looking for a group's constituent, if the identification information of the data carrier is inputted into the retrieval means 1, it specifies the group who corresponds with reference to the information on the storage means 2 based on it. And the current position of other data carriers belonging to the group is searched, and the acquired positional information is outputted as a searcher's-ed whereabouts location.

[0013] For example, when a group's identification information is written in each data carrier, the retrieval means 1 is broadcast from many base stations in a facility of searcher's group's identification information. And the positional information of the base station which received the reply of the identification information is outputted as a retrieval result.

[0014] Moreover, when group management is performed by the database, the retrieval means 1 broadcasts the identification information of the data carrier belonging to the same group as a searcher from a base station. And the positional information of the base station which received the reply of the identification information is outputted as a retrieval result.

[0015] It becomes unnecessary thus, to input a searcher's-ed name etc. at the time of retrieval by associating mutually of two or more same visitors' of a group's data carrier, and managing it. Moreover, the identification information of a searcher's data carrier can be easily inputted by non-contact. Therefore, it becomes possible to only search easily bringing a data carrier close to the sensor part of the retrieval means 1 for a searcher's-ed whereabouts location. Furthermore, an input of a name can be excluded at the time of reception of a visitor, and reception processing of a visitor is simplified.

[0016] Moreover, in the retrieval system by the 2nd principle, the storage means 2 associates the identification information of the data carrier which a searcher possesses, and the identification information of the data carrier which a searcher-ed possesses, and is memorized. Based on the identification information of the above-mentioned searcher's data carrier, the retrieval means 1 searches the location of the above-mentioned searcher's-ed data carrier, and outputs a retrieval result.

[0017] Also in this retrieval system, the case where those data carrier itself is used, and the case where a database is used can be considered as a storage means 2. In the case of the former, the identification information common to a searcher's data carrier and a searcher's-ed data carrier is written in each data carrier. Moreover, in the case of the latter, the identification information of a searcher's data carrier and the identification information of a searcher's-ed data carrier are associated mutually, and it stores them in the database.

[0018] If the identification information of the data carrier is inputted into the retrieval means 1 from a searcher, it specifies the identification information of the data carrier of the searcher-ed who corresponds with reference to the information on the storage means 2 based on it. And the current position of the data carrier is searched and the acquired positional information is outputted as a searcher's-ed whereabouts location.

[0019] Thus, the actuation at the time of reception of a visitor and retrieval becomes easy like the retrieval system of the 1st principle by associating the data carrier of a searcher and a searcher-ed mutually, and managing it.

[0020] For example, the retrieval means 1 of drawing 1 corresponds to the terminal 13 of drawing 2 mentioned later, a base station 15, a network 19, etc., and the storage means 2 corresponds to the data carrier 11 or database 26 of drawing 3.

[0021]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained to a detail, referring to a drawing.

[0022] In the retrieval system of an operation gestalt, common group ID is assigned to the data carrier of the visitor who comes in into two or more persons' group like a family or a class. When a certain group member in one group searches for other group members, the whereabouts location of all the group members of the others which belong to the same group automatically is displayed only by bringing a data carrier close to the position read out device prepared in the facility.

[0023] Thus, by associating the searcher and the searcher-ed by specific ID beforehand, it becomes unnecessary to input a searcher's-ed name, and retrieval of illusion people becomes easy.

[0024] Drawing 2 is the retrieval structure-of-a-system Fig. of an operation gestalt. As well as the data carrier 11 of the wireless type possessed by the visitor of facilities, such as an amusement park, and two or more computer terminals 13 for retrieval inquiries installed by being scattered in the facility, it is [the retrieval system of drawing 2] scattered, it is installed in a facility, and it includes two or more base stations 15 with ID of a proper. A data carrier 11 can communicate with the antenna 12 connected to the terminal 13, and the antenna 16 of a base station 15.

[0025] It connects with a network 19 through a signal converter 14, and a terminal 13 has a function as a position read out device. It connects with a network 19 through a signal converter 14, or a network 19 and communication of a base station 15 are attained through the wireless modem 17. The power-line modem 18 supplies the power from the power line 20 to a base station 15 or a network 19. A signal converter 14 is equipment which performs data conversion required for the communication link on a network 19, and is equivalent to a transceiver in the Local Area Network (LAN) environment using Ethernet.

[0026] As a communication configuration of a data carrier 11, there are an electromagnetic coupling type, an optical communication type, a microwave method, an electromagnetic induction type, etc., and it is decided according to an application any are adopted. Here, a communication range is considered that comparatively long microwave method and electromagnetic induction type are desirable. There are a data carrier without a cell and a thing with a built-in cell in a microwave method, and, generally the data carrier of a communication range with a built-in cell is longer. In a thing with a built-in cell, an accessible distance amounts to several m or dozens of meters.

[0027] An issue-of-banknotes system as shown in drawing 3 is installed in the window which publishes admission tickets, such as an inlet port of a facility. A data carrier 11 has structure convenient to attach to carrying or the body, and has the configuration of small or a card mold. With this operation gestalt, such a data carrier 11 is made to publish to a visitor as an admission ticket.

[0028] The issue-of-banknotes system of drawing 3 contains a terminal unit 21, the server computer 25, and the database 26 that accompanies a server 25. The terminal unit 21 and the server 25 are connected to the network 19 through the signal converter 14. Including an antenna 22, a control section 23, a client computer 24, and a camera 27, read data in a data carrier 11, data are written in a data carrier 11, or a terminal unit 21 has the function to carry out.

[0029] By paying an admission fee, those who enter a facility receive loan of a data carrier 11, and return it in the case of leaving. A server 25 generates unique ID for every visitor based on the request from a client 24 in the case of issue of a data carrier 11. And a client 24 writes ID received from the server 25 in a data carrier 11 by non-contact through a control section 23 and an antenna 22. A database 26 saves ID [finishing / issue]. Moreover, a camera 27 can photo a visitor's image if needed.

[0030] Here, ID recorded on the data carrier 11 which a visitor possesses consists of 32-bit data. As group's constituent's management method, there are an approach of writing group ID in data carrier 11 self and a method of managing group ID by the server 25.

[0031] 24 bits of high orders are made in the case of the former, to be set to unique ID to each visitor as a whole among ID of a data carrier 11, using the group ID section and 8 bits of low order as a personal ID section, as shown in drawing 4. This data carrier 11 considers that that signal is a group alerting signal, when all the personal ID sections of ID signal received to the inquiry by the electric wave from the outside are 0. And if the group ID section of the ID signal is in agreement with the group ID of a data carrier 11, it will return whole ID of a data carrier 11 by wireless.

[0032] Moreover, in the case of the latter, as shown in drawing 5, using 32-bit whole unique ID as a visitor individual's ID, a server 25 relates unique ID of the visitor belonging to the same group with one group ID, and stores it in a database 26. Drawing 6 shows the example of the table stored in a database 26 at this time. If unique ID of this data carrier 11 in received ID signal and a data carrier corresponds to the inquiry by the electric wave from the outside, it will return that unique ID by wireless. [0033] It is necessary to rewrite group ID by the approach of writing group ID in a data carrier 11 according to a new visitor. For this reason, the data carrier in which read/write is possible must be used. On the other hand, it is not necessary to change unique ID of a data carrier 11 by the approach of saving group ID in a database 26. For this reason, a read-only data carrier may be used and, thereby, cost can be reduced.

[0034] Now, in drawing 2. Visitors A and B should belong to the same group, and B should look for the whereabouts location of A. In this case, by bringing the data carrier 11 to possess close to the antenna 12 of a terminal 13, Searcher B is non-contact and inputs ID of a data carrier 11 into a terminal 13. The antenna 12 has played the role of the sensor which detects a data carrier 11, and the role of the reader which reads the data recorded there. Moreover, unique ID of the type of drawing 4 shall be used here.

[0035] Next, all the bits of the personal ID section are set to 0 among inputted unique ID, and unique ID which left only the group ID section as it was broadcast on radio in a facility from a base station 15. The data carrier 11 which the searcher A-ed possesses will answer the nearby base station 15 in unique ID currently recorded on the data carrier 11, if broadcast of the group ID of the group to whom he belongs is detected. Thereby, a base station 15 recognizes that the data carrier 11 received group ID.

[0036] The base station 15 which received the searcher's A-ed unique ID passes the ID information on a network 19 with the base station ID of a base station 15. On the screen of a terminal 13, the area it is decided that will be a meaning is displayed as the searcher's A-ed whereabouts location from the base station ID of the base station which received unique ID. Thereby, Searcher B can recognize the current position of A in a facility promptly.

[0037] According to such a retrieval approach, the whereabouts location of all the constituents of a group including a searcher will be searched in fact, and it will be displayed. For example, Visitors A, B, C, and D shall constitute one group, those personal ID is set to 1, 2, 3, and 4, respectively, and group ID is set to 1. In this case, unique ID of A, B, C, and D is set to 11, 12, 13, and 14, respectively.

[0038] And if B asks a terminal 13 the whereabouts of A when B, C, and D are in the same location, as shown in drawing 7, 12, 13, and 14 which are unique ID of B, C, and D will be displayed on the same area in a facility, and only 11 which is unique ID of A will be displayed on different area. In this way, B can check the whereabouts of A.

[0039] Moreover, when unique ID of A, B, C, and D is set to 1, 2, 3, and 4 using unique ID of the type of drawing 5, respectively, a screen like drawing 8 is displayed similarly. Also in this case, 2, 3, and 4 which are unique ID of B, C, and D are displayed on the same area in a facility, and only 1 which is unique ID of A is displayed on different area.

[0040] Next, actuation of the system in the case of writing group ID in a data carrier 11 is explained to a detail, referring to from drawing 9 to drawing 14.

[0041] Drawing 9 is the flow chart of the issue-of-banknotes processing by the terminal unit 21 of drawing 3. At the time of the issue of banknotes, first, an operator inputs a group's number N into a client 24 (step S1), and a client 24 requests issue of unique ID of N person from a server 25 (step S2). And a judgment is repeated until it judges and (step S3) publishes whether ID was published or not from a server 25.

[0042] At this time, a server 25 has the the same group ID section, and publishes unique ID of N individual from which only the personal ID section differs, respectively. If ID is published, an operator will write them in the data carrier 11 of N individual one by one (step S4), and will end processing.

[0043] Next, drawing 10 is the operation flow chart of a data carrier 11. Whenever the data carrier 11 is supervising whether the signal was received from the exterior (step S11) and receives a signal, it judges whether it is a number (ID inquiry number) for it to ask ID currently recorded in the data carrier 11 (step S12). Here, in case ID inquiry number means specific unique ID all of 32 bits were beforehand decided to be like 0 and the terminal 13 of drawing 2 asks ID of Searcher's B data carrier 11, it is transmitted from an antenna 12.

[0044] If an input signal is ID inquiry number, a data carrier 11 will transmit unique ID currently held (step S13), and will return to actuation of step S11. Moreover, if it is not ID inquiry number next, it will judge whether the group ID section of ID signal and the group ID section of data carrier 11 self which received are in agreement (step S14). If they are in agreement, unique ID currently held is transmitted (step S13), and it returns to actuation of step S11, and unique ID will not be transmitted if not in agreement.

[0045] According to actuation of drawing 10, a data carrier 11 transmits unique ID, only when the group ID of the group to whom ID inquiry number or its data carrier belongs is received. Therefore, it is not answered while the base station 15 is broadcasting other groups' group ID. Thus, since a data carrier 11 is not sent unless the need for retrieval arises, it can attain small electrification and a miniaturization of a data carrier 11.

[0046] Next, drawing 11 and drawing 12 are the flow charts of the retrieval processing by the terminal 13 and base station 15 of drawing 2. A terminal 13 sets the control variable T showing a searcher's-ed count of a call with 0 first (drawing 11, step S21), and judges whether the searcher brought the data carrier 11 close based on the signal from an antenna 12 (step S22). And a judgment is repeated when a data carrier 11 is not detected.

[0047] If a data carrier 11 is detected, through an antenna 12, above-mentioned ID inquiry number will be transmitted (step S23), and it will judge whether unique ID was received from a searcher's data carrier 11 (step S24). And a judgment is repeated when unique ID is not received.

[0048] If unique ID is received, it will be regarded as what was able to ask the whereabouts of a group member from the searcher. And the personal ID section is set to 0, unique ID which left only the group ID section is generated (step S25), and it is made to transmit from each base station 15 (step S26).

[0049] Each base station 15 can communicate with the data carrier 11 in the wireless area (base station area) of about 10 meters of radius numbers. And if there is a data carrier 11 which has the same group ID as the group ID which transmitted in the area, unique ID will be received from the data carrier 11.

[0050] Next, a terminal 13 judges whether all the base stations 15 returned the retrieval result (step S27), and if there is a base station 15 to which the result is not returned, it will repeat a judgment. Here, each base station 15 returns a retrieval result to a terminal 13 with the base station ID. And if all the base stations 15 return a retrieval result, it will judge whether the terminal 13 received unique ID from a searcher's-ed data carrier 11 in one of the base stations 15 (step S28).

[0051] Since a searcher's unique ID is already understood, if unique ID in which one of the base stations 15 differs from it is received for example, it will be judged with what received a searcher's-ed unique ID. If neither of the base stations 15 has received a searcher's-ed unique ID next, it compares with the set point T0 which was able to determine T beforehand (step S29). And if T is T0 or less, it will set with T=T+1 (step S30), and a re-call of a

searcher-ed will be performed at step S26.

[0052] And if T exceeds T0 at step S29, the message "it was not able to discover in retrieval area" will be displayed (step S31), and processing will be ended. Here, retrieval area means the field covered by all the base stations 15.

[0053] When a searcher's-ed unique ID is received in one of the base stations 15 next, it judges whether two or more base stations have received unique ID (drawing 12, step S32). Unique ID which the base station 15 which received unique ID received with the base station area where the base station 15 covers at the time only of one is displayed (step S33), and processing is ended. The information on the base station area of each base station 15 is beforehand related with the base station ID, and is stored in the terminal 13.

[0054] Moreover, it judges whether when there are two or more base stations 15 which received unique ID next, unique ID with two or more same base stations 15 is received (step S34). When two or more base stations 15 have not received one unique ID, the base station area of each base station 15 and unique ID which received are displayed (step S35), and processing is ended. Moreover, when two or more base stations 15 have received one unique ID, the duplication part and unique ID of the base station area of those base stations 15 are displayed (step S36), and processing is ended.

[0055] For example, as shown to drawing 13 by the circle, each base station area in a facility is arranged so that adjoining base station area may overlap mutually, and covers all the fields in a facility of the electric wave from a base station.

[0056] When the searcher A-ed is detected in the base station which makes base station area 31 the detection range, it turns out that A is in area 31. Moreover, when A is detected even in the base station which makes base station area 32 the detection range at coincidence, the location of A is limited into the area 33 which overlaps both area 31 and the area 32. Then, this duplication part 33 is displayed on a screen as a retrieval result.

[0057] A searcher's-ed whereabouts area is limited and the detection precision increases, so that similarly the number of the base stations to detect increases. In the case of drawing 14, A is detected in three base stations which make the detection range base station area 31, 32, and 34, respectively, and the area 35 which is the duplication part of those area is displayed as a retrieval result.

[0058] Next, actuation of the system in the case of managing group ID by the server 25, without writing in a data carrier 11 is explained to a detail, referring to from drawing 15 to drawing 18.

[0059] Drawing 15 is the flow chart of the issue-of-banknotes processing by the terminal unit 21 of drawing 3. At the time of the issue of banknotes, a client 24 sets the control variable m showing the number [finishing / processing] with 0 first (step S41), and an operator inputs unique ID of a data carrier 11 into a client 24 from an antenna 22, after inputting a group's number N into a client 24 (step S42) (step S43). As for the value of m, the increment only of 1 is carried out at this time.

[0060] Next, a client 24 judges whether m was compared with N and unique ID of all the data carriers 11 that should be registered as a group was inputted (step S44). And if m is smaller than N, the message which asks for the input of unique ID of the following data carrier 11 will be displayed, and processing of step S43 will be repeated.

[0061] And if m reaches N, a client 24 will request group registration of unique ID of inputted N individual from a server 25 (step S45). And it judges whether the completion of registration was notified from the server 25 (step S46), and a judgment is repeated until it is completed.

[0062] At this time, a server 25 relates with one group ID unique ID of N individual received from the client 24, as shown in drawing 6, it stores it in a database 26, and performs group registration of a data carrier 11. And in response to delivery and it, a client 24 ends processing for the notice of the completion of group registration to a client 24.

[0063] Next, drawing 16 is the operation flow chart of a data carrier 11. If the data carrier 11 is supervising whether the signal was always received from the exterior (step S51) and receives a signal, it will judge whether it is the above-mentioned ID inquiry number (step S52).

[0064] If an input signal is ID inquiry number, a data carrier 11 will transmit unique ID currently held (step S53), and will return to actuation of step S51. Moreover, if it is not ID inquiry number next, it will judge whether unique ID of ID signal and data carrier 11 self which received is in agreement (step S54). If they are in agreement, unique ID currently held is transmitted (step S53), and it returns to actuation of step S51, and unique ID will not be transmitted if not in agreement.

[0065] According to actuation of drawing 16, a data carrier 11 transmits unique ID, only when unique ID which ID inquiry number or its data carrier holds is received. Therefore, it is not answered while the base station 15 is broadcasting other unique ID.

[0066] Next, drawing 17 and drawing 18 are the flow charts of the retrieval processing by the terminal 13 and base station 15 of drawing 2. A terminal 13 judges first whether the searcher brought the data carrier 11 close based on the signal from an antenna 12 (drawing 17, step S60). And a judgment is repeated when a data carrier 11 is not detected.

[0067] If a data carrier 11 is detected, through an antenna 12, above-mentioned ID inquiry number will be transmitted (step S61), and it will judge whether unique ID was received from a searcher's data carrier 11 (step S62). And a judgment is repeated when unique ID is not received.

[0068] If unique ID is received, it will be regarded as what was able to ask the whereabouts of a group member from the searcher. And a database 26 is searched by using a searcher's unique ID as a search key, and searcher's group's number N and unique ID of all the group's constituents are acquired (step S63). Here, ID (n) is stored in buffer [within a terminal 13] A (n) when the n-th constituent's unique ID is set to ID (n), and (n= 1, 2 and 3, ..., N).

[0069] Next, a terminal 13 sets with 1 the control variable n which identifies buffer A (n) (step S64), sets the control variable T showing the count of a call with 0 (step S65), and makes unique ID currently held at A (n) transmit from each base station 15 (step S66).

[0070] If each base station 15 has the data carrier 11 which has the same ID as unique ID which transmitted in the base station area, it will receive unique ID from the data carrier 11.

[0071] Next, a terminal 13 judges whether all the base stations 15 returned the retrieval result (step S67), and if there is a base station 15 to which the result is not returned, it will repeat a judgment. Here, each base station 15 returns a retrieval result to a terminal 13 with the base station ID. And if all the base stations 15 return a retrieval result, it will judge whether the terminal 13 received the same unique ID as A (n) in one of the base stations 15 (step S68).

[0072] If neither of the base stations 15 has received the unique ID next, it compares with the set point T0 which was able to determine T beforehand (step S69). And if T is T0 or less, it will set with T=T +1 (step S70), and a re-call of a searcher-ed will be performed at step S66.

[0073] When unique ID is received in one of the base stations 15, it judges whether the base station ID of all the received base stations 15 was written in buffer B (n) (step S71), n was compared with N, and all unique ID of A (n) was broadcast (drawing 18 , step S73). If n is smaller than N, only 1 will increment the value of n (step S74), and the processing after step S65 will be repeated. If T exceeds T0 at step S69, 0 will be written in buffer B (n) (step S72), and the processing after step S73 will be repeated.

[0074] If n reaches N at step S73 next, n will be again set with 1 (step S75), and it will judge whether two or more base stations ID are written in buffer B (n) (step S76). If two or more base stations ID are in B (n), those base stations will regard it as what received ID (n), and will display the duplication part of the base station area of those base stations, and ID (n) (step S77). The information on the base station area of each base station is beforehand related with the base station ID, and is stored in the terminal 13.

[0075] And it judges whether n was compared with N and all ID (n) was displayed (step S78). If n is smaller than N, only 1 will increment the value of n (step S79), and the processing after step S76 will be repeated.

[0076] It judges whether if there is no base station ID of the plurality [B / (n)] in step S76 next, 0 is written in B (n) (step S80). when the value of B (n) does not come out zero and only one base station ID is written in, the base station area of the base station and ID (n) are displayed (step S81), and processing after step S78 is performed.

[0077] Moreover, if the value of B (n) is 0, the message "ID (n) was not able to be discovered" will be displayed (step S82), and processing after step S78 will be performed. And processing will be ended if n reaches N at step S78.

[0078] It is also possible to display the name of the group member for which it was searched on the screen of a terminal 13 as an application of an operation gestalt explained above. For example, when the data carrier 11 of drawing 4 is used, an operator inputs the name of the possessor of each data carrier 11 into the client 24 of drawing 3 at the time of the issue of banknotes. And as shown in drawing 19 , a server 25 generates the table which associated the name, the group ID, and personal ID of each group member, and stores it in the database 26.

[0079] At the time of retrieval, the terminal 13 of drawing 2 displays a name [/ instead of unique ID which searched the database 26 and received in steps S33, S35, and S36 of drawing 12]. In the case of the retrieval result shown in drawing 7 , a screen like drawing 20 is displayed by using the name stored in the table of drawing 19 . Thereby, Searcher B can recognize the searcher's A-ed location more clearly. Here, A, B, C, and D express the name of the group member which sets 11, 12, 13, and 14 to unique ID, respectively.

[0080] Moreover, it is also possible to display the image of a group member for which it looked on the screen of a terminal 13 as other applications. In this case, at the time of the issue of banknotes, a visitor's consent is obtained, and the camera 27 of drawing 3 takes that photograph of his face etc., and inputs into a client 24. And a server 25 stores the images 41, 42, 43, and 44 of each group member in a database 26, as shown in drawing 21 . Moreover, the table which associated the pointer, the group ID, and personal ID which point out the storing field of those images is generated, and it is stored in the database 26.

[0081] At the time of retrieval, the terminal 13 of drawing 2 displays an image [/ instead of unique ID which searched the database 26 and received in steps S33, S35, and S36 of drawing 12]. In the case of the retrieval result shown in drawing 7 , a screen like drawing 22 is displayed by using the pointer stored in the table of drawing 21 . Thereby, Searcher B can recognize the searcher's A-ed location more clearly. Here, images 41, 42, 43, and 44 express the photograph of his face of the group member which sets 11, 12, 13, and 14 to unique ID, respectively.

[0082] According to the approach of displaying an image on the screen of a retrieval result, since an operator does not need to input a name, rather than the approach of displaying a name, the efficiency of issue-of-banknotes processing is increased, and a data carrier 11 can be promptly published also in group of a lot of people. Moreover, also when the data carrier 11 of drawing 5 is used, a name and an image can be displayed by generating the same table as drawing 19 or drawing 21 .

[0083] Moreover, in this operation gestalt, those who have been behind from after can also be added to the same group as the person who already came in by rewriting the group ID of a data carrier 11, or rewriting the table of a database 26. Furthermore, it is also possible to charge the costs generated in facilities, such as a toll of an attraction, for every group ID, and to liquidate them per group at the time of leaving.

[0084] As the terminal 13 of drawing 2 , the client 24 of drawing 3 , and a server 25, an information processor (computer) as shown in drawing 23 is used, for example. The information processor of drawing 23 is equipped with CPU51, memory 52, an input unit 53, an output unit 54, external storage 55, the medium driving gear 56, and network

connection equipment 57, and they are mutually connected by the bus 58.

[0085] The program and data which are used for processing are stored in memory 52. As memory 52, ROM (read only memory), RAM (random access memory), etc. are used, for example. CPU51 performs each processing of a retrieval system which was mentioned above by performing a program using memory 52.

[0086] Input devices 53 are a keyboard, a pointing device, a touch panel, etc., and are used for required directions or an informational input. Output units 54 are a display, a printer, etc. and output the inquiry matter to a retrieval result or an operator.

[0087] External storage 55 is a magnetic disk drive, an optical disk unit, magneto-optic-disk (magneto-optical disk) equipment, etc. An above-mentioned program and data are saved at this external storage 55, and it can also be used if needed, being able to load them to memory 52.

[0088] The medium driving gear 56 drives the portable record medium 59, and accesses the contents of record. As a portable record medium 59, record media which arbitration can computer read, such as a memory card, a floppy (trademark) disk, CD-ROM (compact disk read only memory), an optical disk, and a magneto-optic disk, are used. An above-mentioned program and data are stored in this portable record medium 59, and it can also be used if needed, being able to load them to memory 52.

[0089] Network connection equipment 57 communicates with external equipment through the network (circuit) 19 of arbitration, such as LAN (local area network). Thereby, they can also be used for memory 52 if needed, being able to load an above-mentioned program and data to reception from external equipment, and loading.

[0090] Drawing 24 shows the record medium which can supply a program and data and in which computer reading is possible to the information processor of drawing 23. The program and data which were saved in the portable record medium 59 or the external database 60 are loaded to memory 52. And CPU51 performs the program using the data, and performs required processing. Moreover, the external storage 55 of drawing 23 and the database 60 of drawing 24 are used as a database 26 of drawing 3.

[0091] Moreover, drawing 25 shows the example of a configuration of a data carrier 11. The data carrier of drawing 25 includes an antenna 61, a control section 62, the storage section 63, and a power supply section 64. An antenna 61 transmits and receives a signal between external antennas, and the storage section 63 memorizes unique ID like drawing 4 or drawing 5. A control section 62 controls the communication link by the antenna 61, and performs read/write of the data to the storage section 63. Moreover, a power supply section 64 supplies a power source to an antenna 61, a control section 62, and the storage section 63.

[Translation done.]

* NOTICES *

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3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

- [Drawing 1] It is the principle Fig. of the retrieval system of this invention.
- [Drawing 2] It is a retrieval structure-of-a-system Fig.
- [Drawing 3] It is an issue-of-banknotes structure-of-a-system Fig.
- [Drawing 4] It is drawing showing the 1st data carrier.
- [Drawing 5] It is drawing showing the 2nd data carrier.
- [Drawing 6] It is drawing showing the 1st table.
- [Drawing 7] It is drawing showing the 1st display screen.
- [Drawing 8] It is drawing showing the 2nd display screen.
- [Drawing 9] It is the flow chart of the 1st issue-of-banknotes processing.
- [Drawing 10] It is the operation flow chart of the 1st data carrier.
- [Drawing 11] It is the flow chart (the 1) of the 1st retrieval processing.
- [Drawing 12] It is the flow chart (the 2) of the 1st retrieval processing.
- [Drawing 13] It is drawing showing the 1st duplication area.
- [Drawing 14] It is drawing showing the 2nd duplication area.
- [Drawing 15] It is the flow chart of the 2nd issue-of-banknotes processing.
- [Drawing 16] It is the operation flow chart of the 2nd data carrier.
- [Drawing 17] It is the flow chart (the 1) of the 2nd retrieval processing.
- [Drawing 18] It is the flow chart (the 2) of the 2nd retrieval processing.
- [Drawing 19] It is drawing showing the 2nd table.
- [Drawing 20] It is drawing showing the 3rd display screen.
- [Drawing 21] It is drawing showing the 3rd table.
- [Drawing 22] It is drawing showing the 4th display screen.
- [Drawing 23] It is the block diagram of an information processor.
- [Drawing 24] It is drawing showing a record medium.
- [Drawing 25] It is the block diagram of a data carrier.

[Description of Notations]

- 1 Retrieval Means
- 2 Storage Means
- 11 Data Carrier
- 12, 16, 22, 61 Antenna
- 13 Terminal
- 14 Signal Converter
- 15 Base Station
- 17 Wireless Modem
- 18 Power-Line Modem
- 19 Network
- 20 Power Line
- 21 Terminal Unit
- 23 62 Control section
- 24 Client Computer
- 25 Server Computer
- 26 60 Database
- 27 Camera
- 31, 32, 34 Base station area
- 33 35 Duplication area
- 41, 42, 43, 44 Image
- 51 CPU
- 52 Memory
- 53 Input Unit
- 54 Output Unit
- 55 External Storage

- 56 Medium Driving Gear
- 57 Network Connection Equipment
- 58 Bus
- 59 Portable Record Medium
- 63 Storage Section
- 64 Power Supply Section

[Translation done.]

*** NOTICES ***

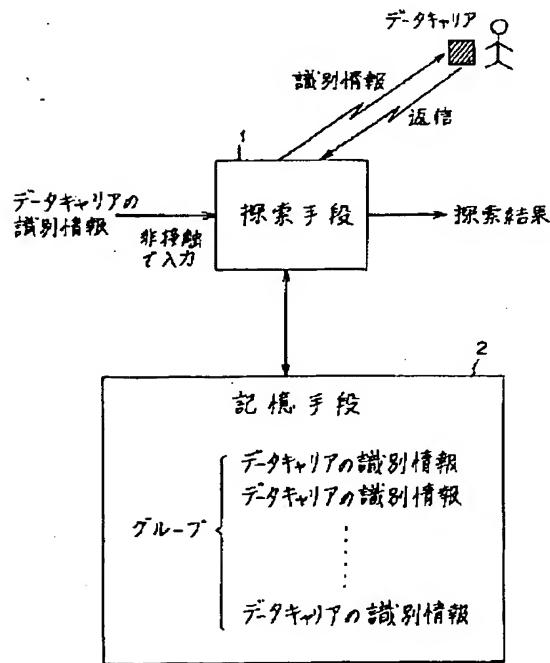
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DRAWINGS

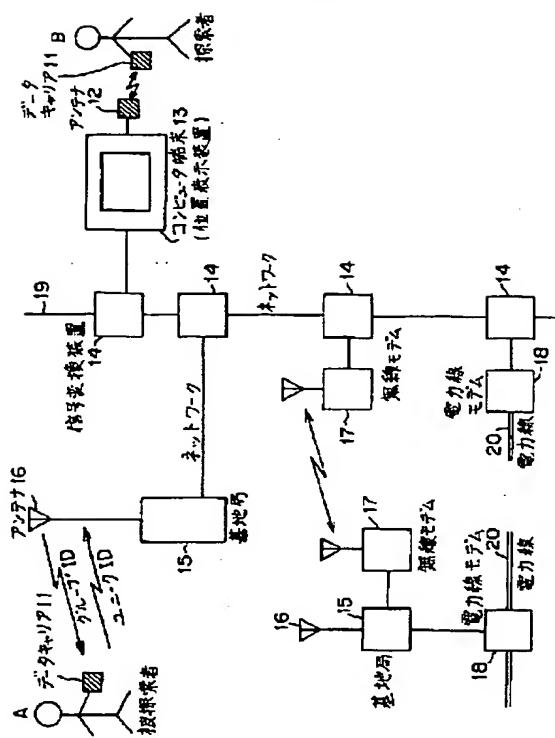
[Drawing 1]

本発明の原理図



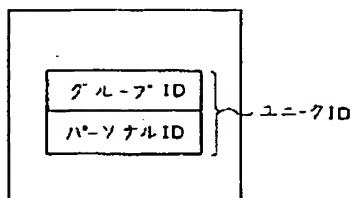
[Drawing 2]

探索システムの構成図



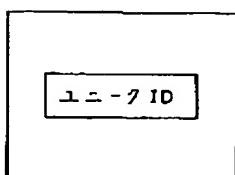
[Drawing 4]

第1のデータキャリアを示す図



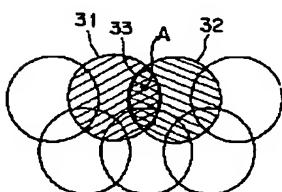
[Drawing 5]

第2のデータキャリアを示す図



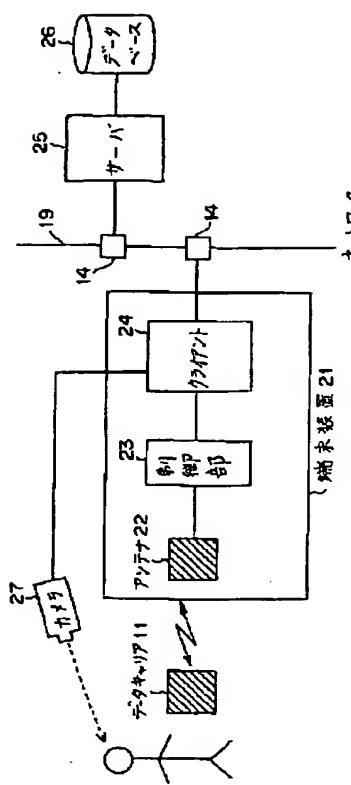
[Drawing 13]

第1の重複エリアを示す図



[Drawing 3]

発券システムの構成図

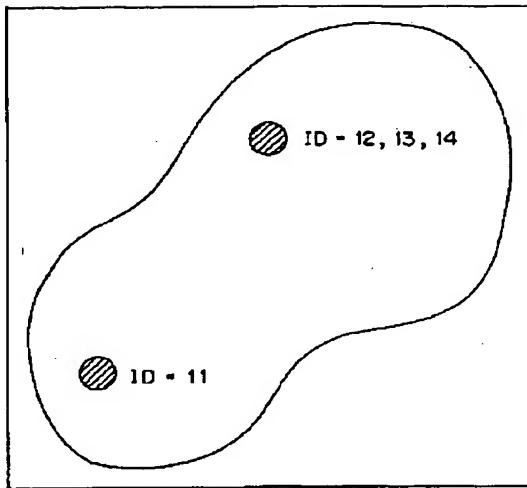


[Drawing 6]
第1のテーブルを示す図

グループID	ユニークID
1	1 2 3 ... N
2	1 2 3 ...

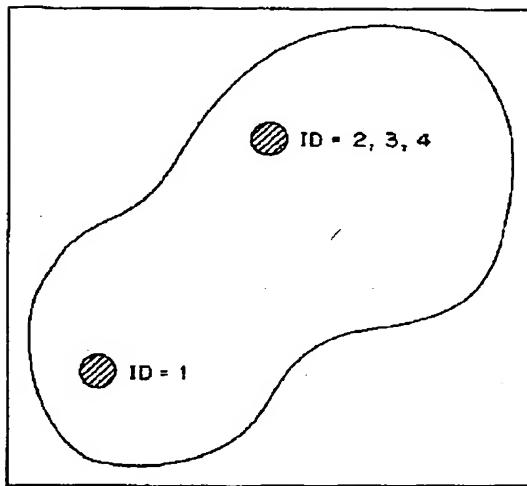
[Drawing 7]

第1の表示画面を示す図



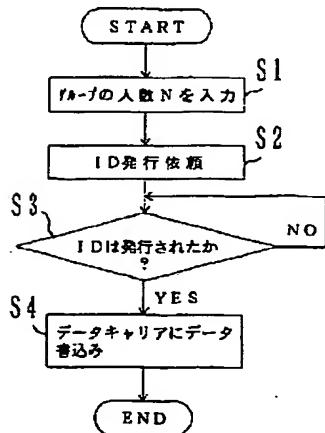
[Drawing 8]

第2の表示画面を示す図

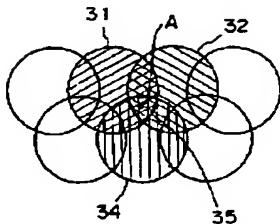


[Drawing 9]

第1の発券処理のフローチャート



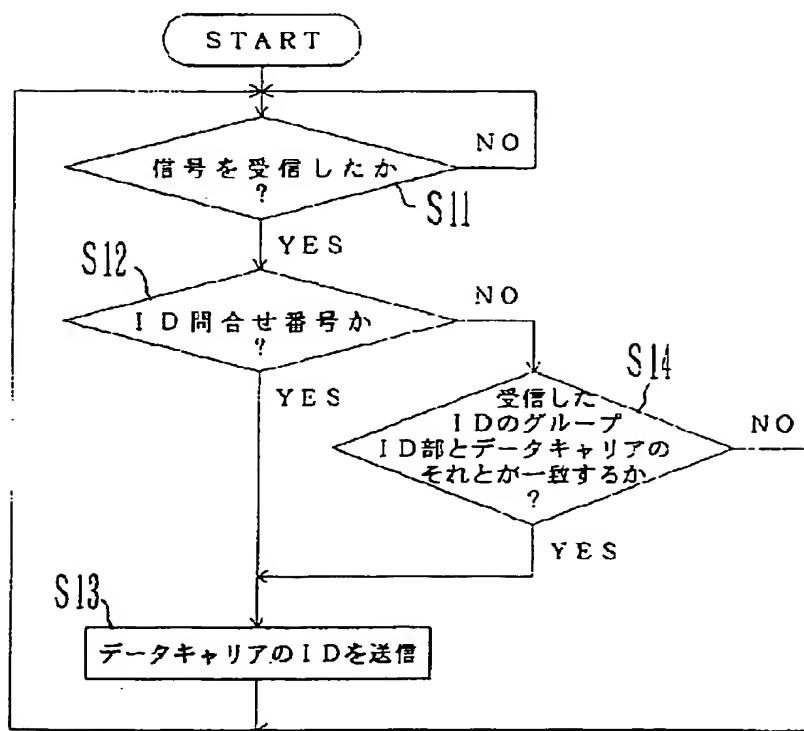
[Drawing 14]
第2の重複エリアを示す図



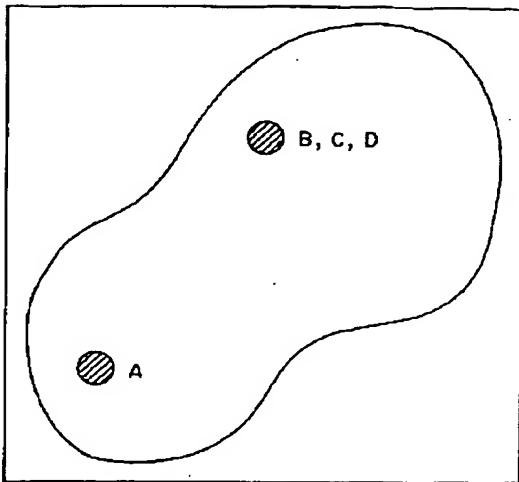
[Drawing 19]
第2のテーブルを示す図

グループID	バーソナルID	名前
1	1 2 3 4	A B C D
2	1 2 3 ⋮	AA BB CC ⋮

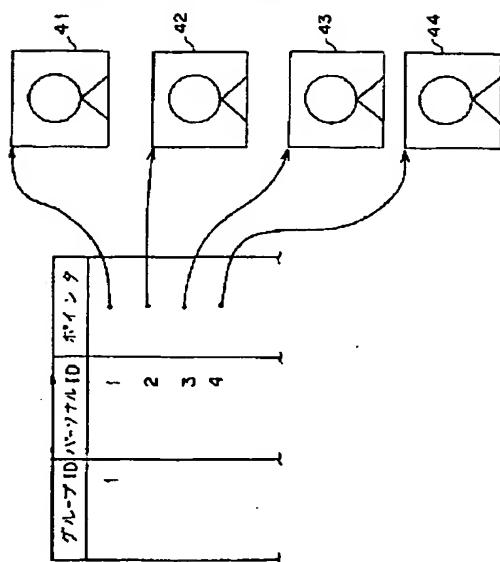
[Drawing 10]
第1のデータキャリアの動作フローチャート



[Drawing 20]
第3の表示画面を示す図

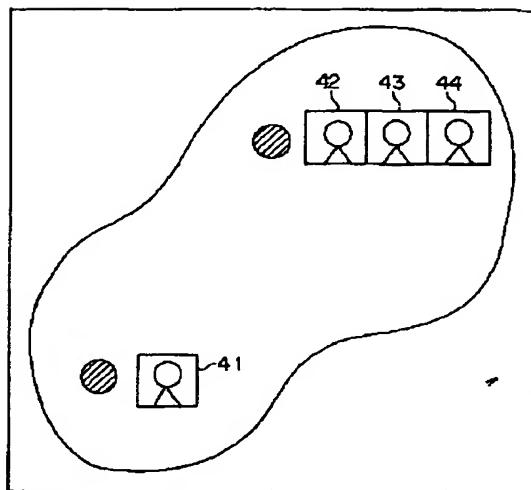


[Drawing 21]
第3のテーブルを示す図



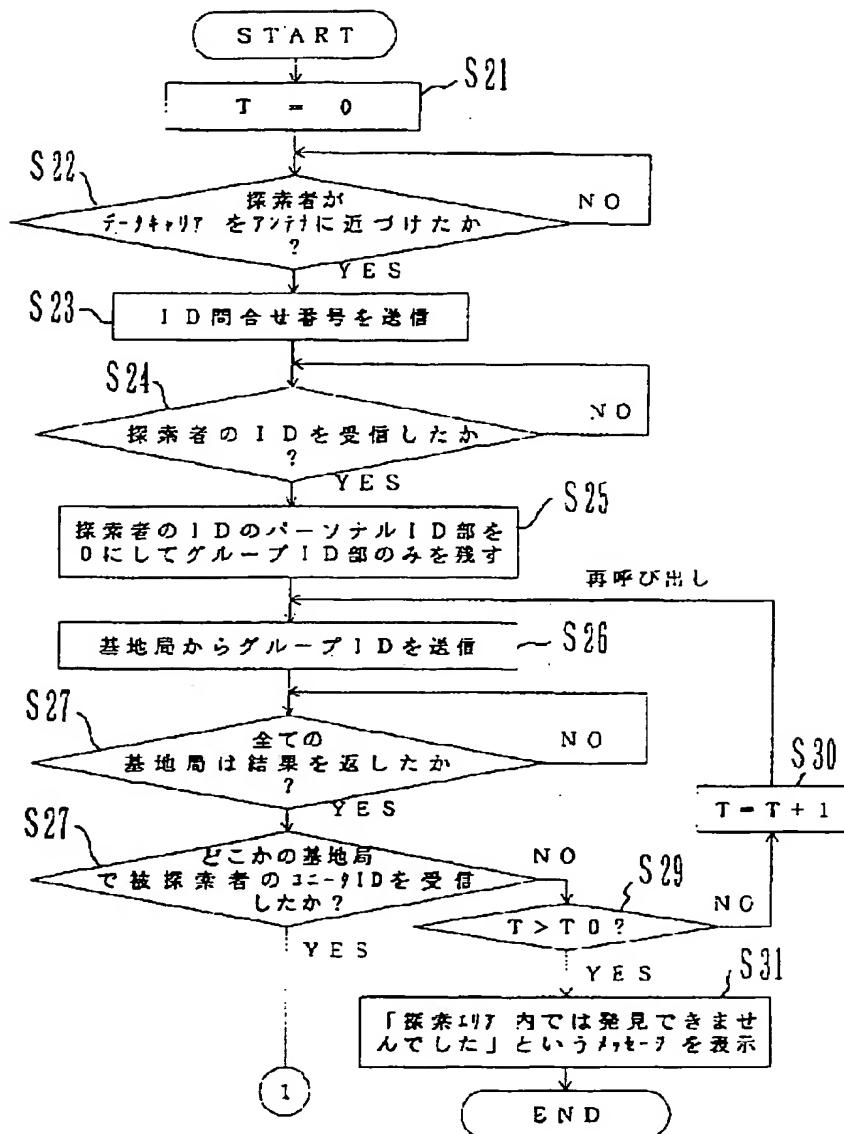
[Drawing 22]

第4の表示画面を示す図



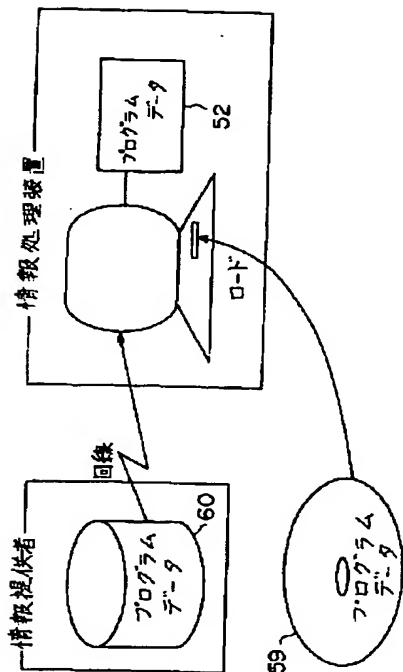
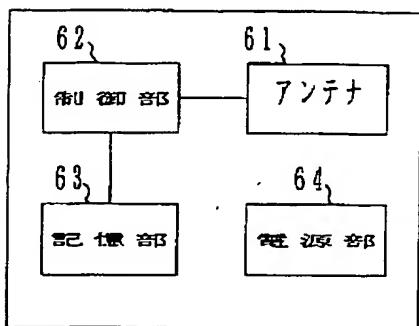
[Drawing 11]

第1の探索処理のフロー・チャート(その1)



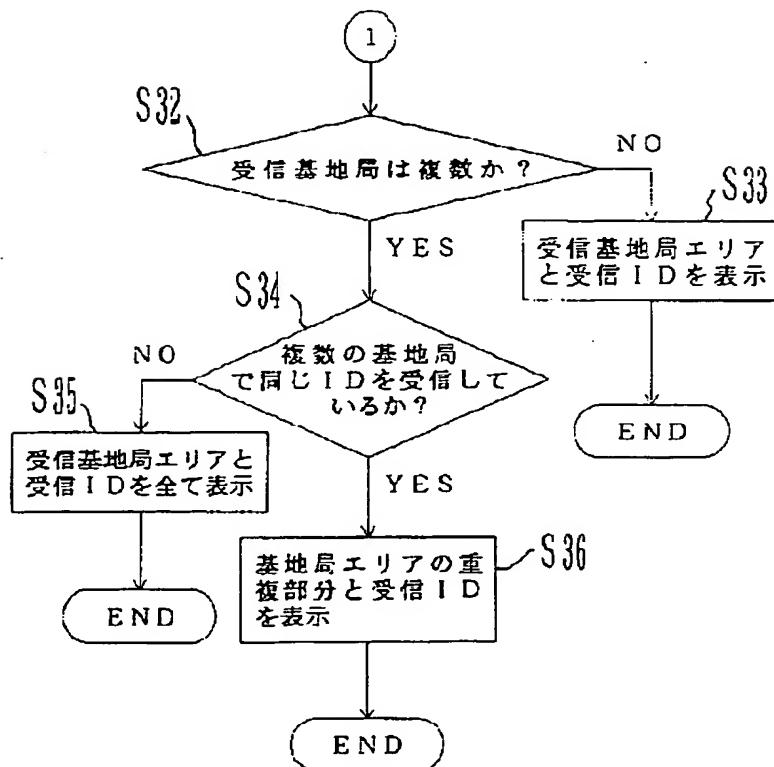
[Drawing 24]

記録媒体を示す図

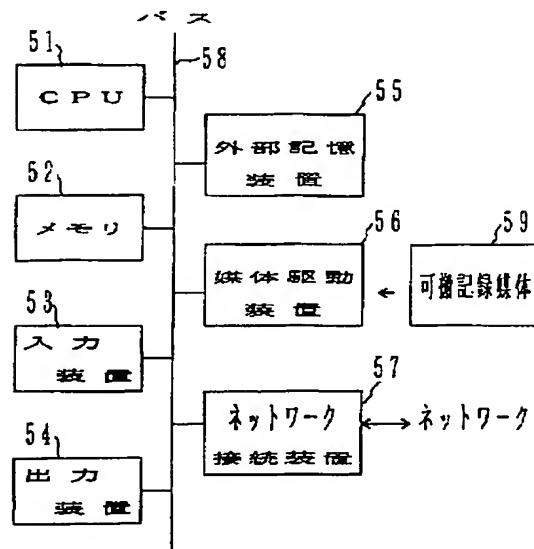
[Drawing 25]
データキャリアの構成図

[Drawing 12]

第1の探索処理のフローチャート（その2）

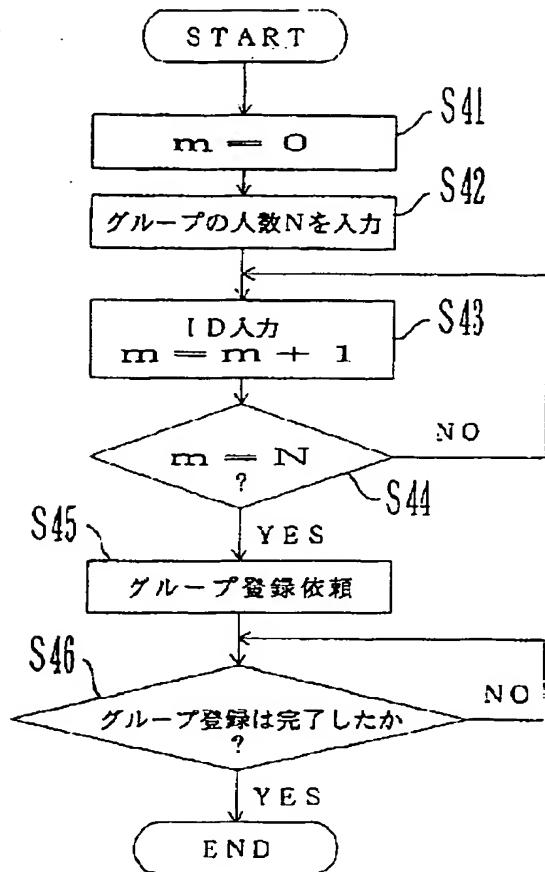


[Drawing 23]
情報処理装置の構成図



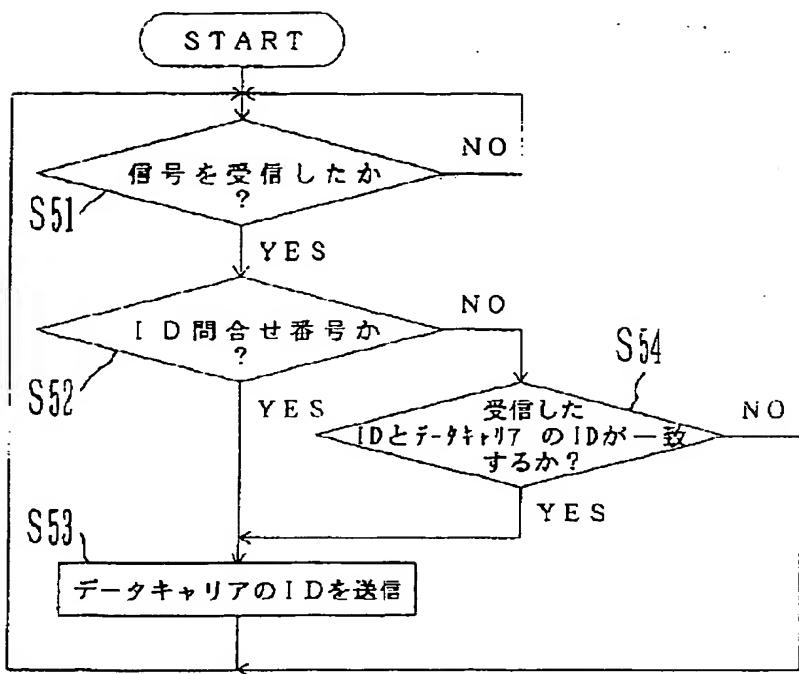
[Drawing 15]

第2の発券処理のフローチャート



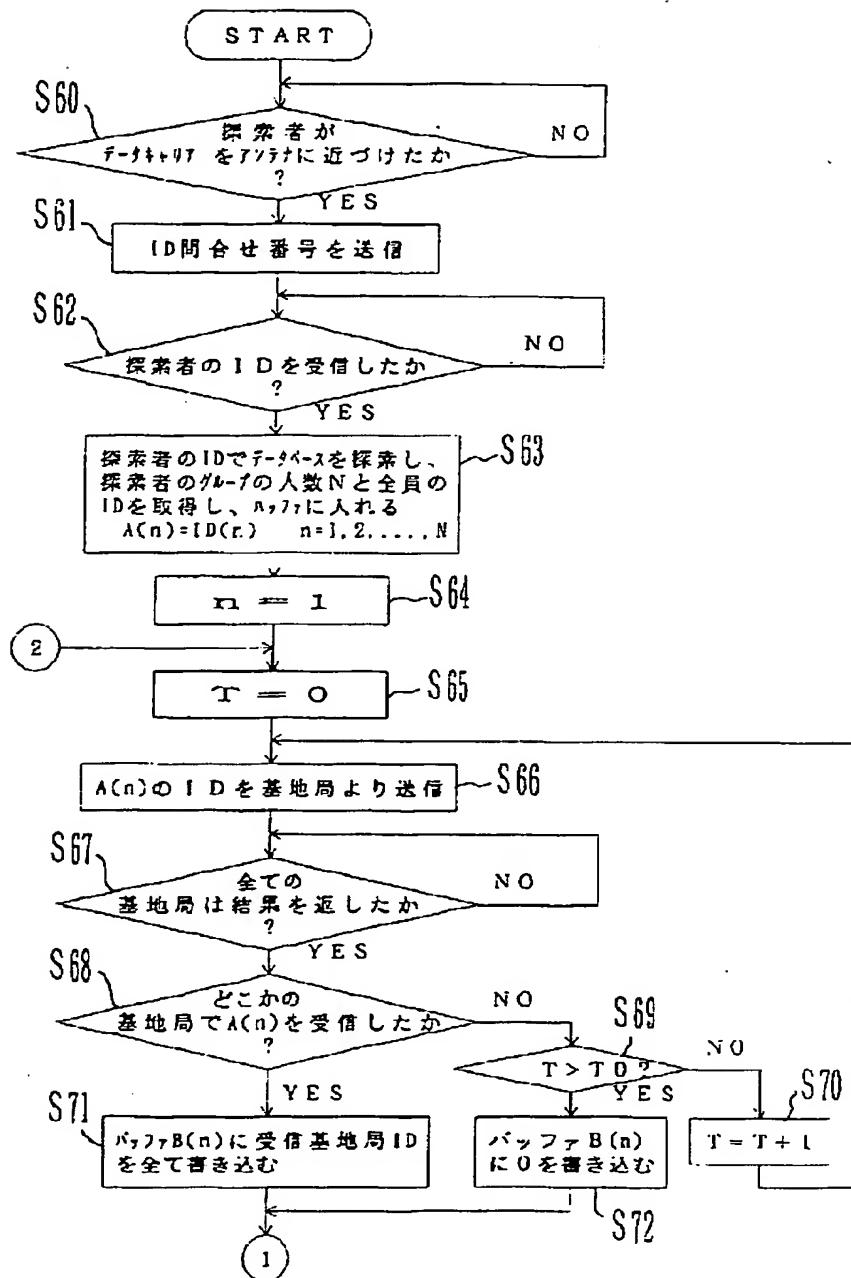
[Drawing 16]

第2のデータキャリアの動作フローチャート



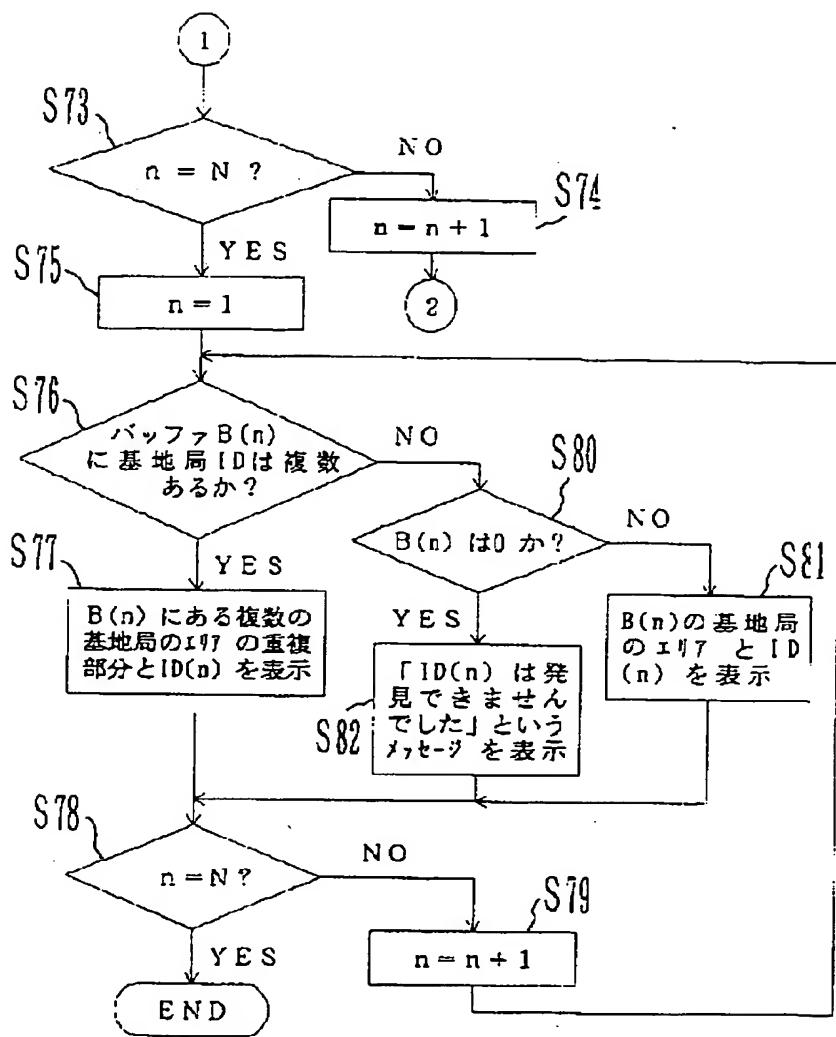
[Drawing 17]

第2の探索処理のフローチャート(その1)



[Drawing 18]

第2の探索処理のフローチャート(その2)



[Translation done.]

(19)日本国特許庁 (JP)

(12) 公開特許公報 (A)

(11)特許出願公開番号

特開2000-187794

(P2000-187794A)

(43)公開日 平成12年7月4日(2000.7.4)

(51)Int.Cl.⁷
G 0 8 G 1/005
B 4 2 D 15/10
G 0 6 K 17/00

識別記号

19/07

F I
G 0 8 G 1/005
B 4 2 D 15/10
G 0 6 K 17/00

G 0 8 G 1/13

テーマコード(参考)
2 C 0 0 5
2 C 0 3 2
F 5 B 0 3 5
L 5 B 0 5 8
5 H 1 8 0

審査請求 未請求 請求項の数14 OL (全19頁) 最終頁に続く

(21)出願番号 特願平10-364409

(22)出願日 平成10年12月22日(1998.12.22)

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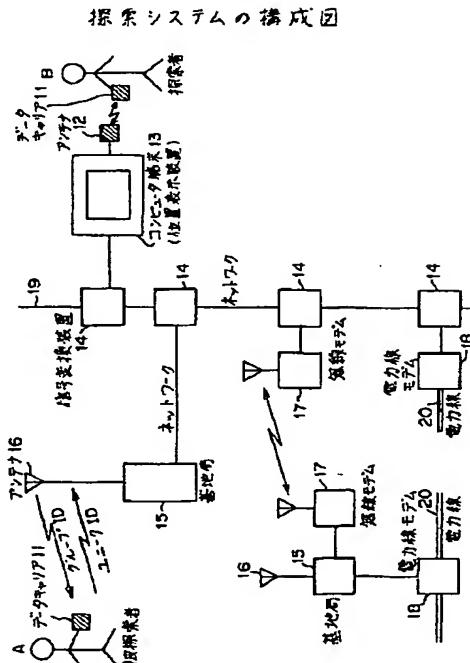
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(54)【発明の名称】 グループ員探索システムおよび方法

(57)【要約】

【課題】 簡単な操作で施設の入場者の所在場所を探索することが課題である。

【解決手段】 探索者Bが、同じグループに属する被探索者Aの所在場所を知るために、データキャリア11をアンテナ12に近づけると、端末13は、そのデータキャリア11のユニークIDを読み取り、対応するグループIDを抽出する。基地局15は、グループIDを施設内に放送し、同じグループIDを含むユニークIDを有する被探索者Aのデータキャリア11から返信を受け。返信を受けた基地局15の位置情報は、探索結果として端末13の画面に表示される。



1

【特許請求の範囲】

【請求項1】 1つのグループに属する複数のデータキャリアの識別情報を、該グループと関連付けて記憶する記憶手段と、
前記複数のデータキャリアのうちの1つのデータキャリアの識別情報に基づいて、他のデータキャリアの位置を探索し、探索結果を出力する探索手段とを備えることを特徴とする探索システム。

【請求項2】 前記記憶手段は、前記グループの識別情報を有する前記複数のデータキャリアを含むことを特徴とする請求項1記載の探索システム。

【請求項3】 前記記憶手段は、前記複数のデータキャリアの識別情報を互いに関連付けて格納するデータベース手段を含むことを特徴とする請求項1記載の探索システム。

【請求項4】 前記探索手段は、前記1つのデータキャリアが近づけられたことを検知して、該1つのデータキャリアの識別情報を自動的に読み取るリーダ手段を含むことを特徴とする請求項1記載の探索システム。

【請求項5】 前記探索手段は、前記複数のデータキャリアのうち交信可能な位置にあるデータキャリアに、探索対象のデータキャリアの識別情報の少なくとも一部のデータを送信する1つ以上の基地局手段を含み、該基地局手段から該データを受信したデータキャリアは、受信したデータが、該受信したデータキャリアの保持する識別情報の少なくとも一部と一致するとき、該保持する識別情報を該基地局手段に返信することを特徴とする請求項1記載の探索システム。

【請求項6】 前記探索手段は、前記1つ以上の基地局手段のうち、前記交信可能な位置にあるデータキャリアから識別情報を受信した基地局手段に対応するエリアを、前記探索結果として表示する表示手段を含むことを特徴とする請求項5記載の探索システム。

【請求項7】 探索者が所持するデータキャリアの識別情報と、被探索者が所持するデータキャリアの識別情報を関連付けて記憶する記憶手段と、
前記探索者のデータキャリアの識別情報に基づいて、前記被探索者のデータキャリアの位置を探索し、探索結果を出力する探索手段とを備えることを特徴とする探索システム。

【請求項8】 探索者のデータキャリアの識別情報を入力し、入力された識別情報から該探索者の属するグループの識別情報を生成する入力手段と、
前記グループの識別情報を探索範囲に放送し、該グループに属する被探索者のデータキャリアから識別情報を受信する1つ以上の基地局手段と、
被探索者のデータキャリアから識別情報を受信した基地局手段の位置情報を出力する出力手段とを備えることを特徴とする探索システム。

【請求項9】 1つのグループに属する複数のデータキ

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ヤリアの識別情報を、互いに関連付けて記憶する記憶手段と、

前記グループに属する探索者のデータキャリアの識別情報を入力し、入力された識別情報に基づいて、該グループに属する被探索者のデータキャリアの識別情報を前記記憶手段から取得する入力手段と、
前記記憶手段から取得した識別情報を探索範囲に放送し、前記被探索者のデータキャリアから識別情報を受信する1つ以上の基地局手段と、

10 被探索者のデータキャリアから識別情報を受信した基地局手段の位置情報を出力する出力手段とを備えることを特徴とする探索システム。

【請求項10】 外部からの信号に応答して、保持するデータを返信するデータキャリアであって、
1つのグループに属する複数のデータキャリアに共通する、該グループの識別情報を記憶する記憶手段と、
前記グループに属するデータキャリアの位置を探索するための問合せ信号を受信する受信手段と、
前記問合せ信号に前記グループの識別情報が含まれるか

20 どうかを判定する判定手段と、
前記信号に前記グループの識別情報が含まれるとき、該グループの識別情報を受信したことを示す信号を送信する送信手段とを備えることを特徴とするデータキャリア。

【請求項11】 コンピュータのためのプログラムを記録した記録媒体であって、

1つのグループに属する複数のデータキャリアの識別情報を、該グループと関連付けて記憶する機能と、

前記複数のデータキャリアのうちの1つのデータキャリアの識別情報に基づいて、他のデータキャリアの位置を探索する機能と、
探索結果を出力する機能とを前記コンピュータに実現させるためのプログラムを記録したコンピュータ読み取り可能な記録媒体。

【請求項12】 コンピュータのためのプログラムを記録した記録媒体であって、
探索者が所持するデータキャリアの識別情報と、被探索者が所持するデータキャリアの識別情報を関連付けて記憶する機能と、
前記探索者のデータキャリアの識別情報に基づいて、前記被探索者のデータキャリアの位置を探索する機能と、
探索結果を出力する機能とを前記コンピュータに実現させるためのプログラムを記録したコンピュータ読み取り可能な記録媒体。

40 【請求項13】 1つのグループに属する複数のデータキャリアの識別情報を、あらかじめ該グループと関連付けておき、
前記複数のデータキャリアのうちの1つのデータキャリアの識別情報に基づいて、他のデータキャリアの位置を探索し、

探索結果を出力することを特徴とする探索方法。

【請求項14】探索者が所持するデータキャリアの識別情報と、被探索者が所持するデータキャリアの識別情報報告とをあらかじめ関連付けておき、前記探索者のデータキャリアの識別情報に基づいて、前記被探索者のデータキャリアの位置を探索し、探索結果を出力することを特徴とする探索方法。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、遊園地（アミューズメントパーク）や見本市会場等のあらかじめ決められたエリア内において、所在の分からなくなってしまった入場者の探索を行う探索システムおよびその方法に関する。

【0002】

【従来の技術とその問題点】アミューズメントパーク、見本市会場、デパート、博物館、美術館など、多数の来訪者が一度に入場する施設においては、混雑のために、特定の入場者を探し出すことは非常に困難である。このため、例えば、両親からはぐれてしまった子供や、団体からはぐれてしまった人などを探すために、多くの労力を要する。

【0003】このような施設内の入場者の所在を管理し、迷い人を探索するための従来の技術としては、「施設内所在管理システム」（特開平7-56991）がある。このシステムでは、各入場者にデータキャリアを持たせ、施設内に設けられたゲートなどでそのID（識別子）を読み取ることで、入場者が移動した経路を管理している。ここで、データキャリアとは、電気的な素子でデータを記憶し、非接触でデータの交信を行う装置を意味する。

【0004】迷い人の問合せがあると、システムはその氏名からデータキャリアのIDを特定し、対応するデータキャリアを持った人物が通過するかどうかを各ゲートで監視する。

【0005】しかしながら、このようなシステムでは、被探索者である迷い人がいずれかのゲートを通過するまでその所在が明らかではなく、探索にかなりの待ち時間を要する。また、迷い人がいずれのゲートも通過することなく移動している場合は、探索が非常に困難である。

【0006】さらに、入場者の個人名とデータキャリアのIDとを対応付けて管理するため、すべての入場者の氏名をあらかじめ登録しておく必要があり、その入力のための手間を要する。迷い人の問合せを行う際にも、その氏名を入力する必要があり、登録時と同じ氏名を入力しなければ、正確な探索は行われない。このため、入場時には、氏名の入力作業に細心の注意を要する。

【0007】本発明の課題は、比較的簡単な操作で多数の入場者の受付を行い、容易に被探索者の所在場所を探索することのできる探索システムおよびその方法を提供することである。

【0008】

【課題を解決するための手段】図1は、本発明の探索システムの原理図である。図1の探索システムは、探索手段1と記憶手段2を備え、本発明の第1および第2の原理を含む。

【0009】第1の原理による探索システムにおいて、記憶手段2は、1つのグループに属する複数のデータキャリアの識別情報を、そのグループと関連付けて記憶する。探索手段1は、上記複数のデータキャリアのうちの1つのデータキャリアの識別情報に基づいて、他のデータキャリアの位置を探索し、探索結果を出力する。

【0010】データキャリアは施設などの各入場者により所持され、外部からの信号に応答して、保持するデータを返信することができる。特定のグループに属する複数の入場者のデータキャリアは、記憶手段2により1つのグループとして管理される。

【0011】記憶手段2としては、それらのデータキャリア自身を用いる場合と、データベースを用いる場合と考えられる。前者の場合は、同じグループに属するデータキャリアに共通する、グループの識別情報を、各データキャリアに書き込んでおく。また、後者の場合は、同じグループに属するデータキャリアの識別情報を、互いに関連付けてデータベースに格納しておく。

【0012】探索手段1は、グループの構成員を探している探索者から、そのデータキャリアの識別情報を入力されると、それに基づいて記憶手段2の情報を参照し、対応するグループを特定する。そして、そのグループに属する他のデータキャリアの現在位置を探索し、得られた位置情報を被探索者の所在位置として出力する。

【0013】例えば、グループの識別情報が各データキャリアに書き込まれている場合、探索手段1は、探索者のグループの識別情報を施設内の多数の基地局から放送する。そして、その識別情報の返信を受けた基地局の位置情報を、探索結果として出力する。

【0014】また、データベースでグループ管理が行われている場合は、探索手段1は、探索者と同じグループに属するデータキャリアの識別情報を基地局から放送する。そして、その識別情報の返信を受けた基地局の位置情報を、探索結果として出力する。

【0015】このように、同じグループの複数の入場者のデータキャリアを、互いに関連付けて管理することで、探索時に被探索者の氏名などを入力する必要がなくなる。また、探索者のデータキャリアの識別情報は、非接触で簡単に入力することができる。したがって、探索手段1のセンサ部分にデータキャリアを近づけるだけで、容易に被探索者の所在場所を探索することが可能になる。さらに、入場者の受付時においても、氏名の入力作業を省くことができ、入場者の受付処理が簡単化される。

【0016】また、第2の原理による探索システムにお

いて、記憶手段2は、探索者が所持するデータキャリアの識別情報と、被探索者が所持するデータキャリアの識別情報とを関連付けて記憶する。探索手段1は、上記探索者のデータキャリアの識別情報に基づいて、上記被探索者のデータキャリアの位置を探索し、探索結果を出力する。

【0017】この探索システムにおいても、記憶手段2としては、それらのデータキャリア自身を用いる場合と、データベースを用いる場合とが考えられる。前者の場合は、探索者のデータキャリアと被探索者のデータキャリアに共通する識別情報を、各データキャリアに書き込んでおく。また、後者の場合は、探索者のデータキャリアの識別情報と被探索者のデータキャリアの識別情報を、互いに関連付けてデータベースに格納しておく。

【0018】探索手段1は、探索者からそのデータキャリアの識別情報を入力されると、それに基づいて記憶手段2の情報を参照し、対応する被探索者のデータキャリアの識別情報を特定する。そして、そのデータキャリアの現在位置を探索し、得られた位置情報を被探索者の所在位置として出力する。

【0019】このように、探索者と被探索者のデータキャリアを、互いに関連付けて管理することで、第1の原理の探索システムと同様に、入場者の受付時および探索時の操作が容易になる。

【0020】例えば、図1の探索手段1は、後述する図2の端末13、基地局15、ネットワーク19などに対応し、記憶手段2は、図3のデータキャリア11またはデータベース26に対応する。

【0021】

【発明の実施の形態】以下、図面を参照しながら、本発明の実施の形態を詳細に説明する。

【0022】実施形態の探索システムにおいては、家族やクラスなどのように2人以上のグループで入場する入場者のデータキャリアに対して、共通のグループIDを割り当てる。1つのグループ内のあるグループ員が他のグループ員を探索する場合、施設内に設けられた位置表示装置にデータキャリアを近付けるだけで、自動的に同じグループに属する他のすべてのグループ員の所在位置が表示される。

【0023】このように、探索者と被探索者とをあらかじめ特定のIDにより関連付けておくことにより、被探索者の氏名を入力する必要がなくなり、迷い人の探索が容易になる。

【0024】図2は、実施形態の探索システムの構成図である。図2の探索システムは、アミューズメントパークなどの施設の入場者に所持される無線式のデータキャリア11、施設内に散在して設置された探索問合せ用の複数のコンピュータ端末13と、同じく施設内に散在して設置され、固有のIDを持つ複数の基地局15とを含む。データキャリア11は、端末13に接続されたアン

テナ12および基地局15のアンテナ16と交信することができる。

【0025】端末13は、信号変換装置14を介してネットワーク19に接続され、位置表示装置としての機能を持つ。基地局15は、信号変換装置14を介してネットワーク19に接続されるか、または無線モデム17を介してネットワーク19と交信可能になっている。電力線モデム18は、電力線20からの電力を基地局15やネットワーク19に供給する。信号変換装置14は、ネットワーク19上での通信に必要なデータ変換を行う装置で、Ethernetを用いたローカルエリアネットワーク(LAN)環境では、トランシーバに相当する。

【0026】データキャリア11の通信形態としては、電磁結合方式、光通信方式、マイクロ波方式、電磁誘導方式などがあり、いずれを採用するかは用途に応じて決められる。ここでは、通信距離が比較的長いマイクロ波方式や電磁誘導方式が望ましいと考えられる。マイクロ波方式には、電池なしのデータキャリアと、電池内蔵のものとがあり、一般に、電池内蔵のデータキャリアの方が通信距離は長い。電池内蔵のものでは、アクセス可能な距離は数メートルまたは数十メートルに達する。

【0027】施設の入口などの入場券を発行する窓口には、図3に示すような発券システムが設置される。データキャリア11は、持ち運びや身に付けるのに便利な構造を持ち、小型またはカード型の形状を持つ。本実施形態では、このようなデータキャリア11を、入場券として来訪者に発行することにする。

【0028】図3の発券システムは、端末装置21、サーバコンピュータ25、およびサーバ25に付随するデータベース26を含む。端末装置21とサーバ25は、信号変換装置14を介してネットワーク19に接続されている。端末装置21は、アンテナ22、制御部23、クライアントコンピュータ24、およびカメラ27を含み、データキャリア11からデータを読み取ったり、データキャリア11にデータを書き込んだりする機能を持つ。

【0029】施設に入場する人は、入場料を支払うことにより、データキャリア11の貸与を受け、退場の際にそれを返却する。データキャリア11の発行の際、サーバ25は、クライアント24からの依頼に基づき、入場者毎にユニークなIDを生成する。そして、クライアント24は、サーバ25から受け取ったIDを、制御部23とアンテナ22を介して、非接触でデータキャリア11に書き込む。データベース26は、発行済のIDを保存する。また、カメラ27は、必要に応じて、入場者の画像を撮影することができる。

【0030】ここで、入場者が所持するデータキャリア11に記録されたIDは、例えば、32ビットのデータで構成される。グループの構成員の管理方法としては、データキャリア11自身にグループIDを書き込む方法

と、グループIDをサーバ25で管理する方法とがある。

【0031】前者の場合、図4に示すように、データキャリア11のIDのうち、上位24ビットをグループID部、下位8ビットをパーソナルID部として用い、全体として各入場者にユニークなIDになるようとする。このデータキャリア11は、外部からの電波による問合せに対して、受け取ったID信号のパーソナルID部がすべて0であった場合、その信号をグループ呼出し信号とみなす。そして、そのID信号のグループID部が、データキャリア11のグループIDに一致すると、データキャリア11のID全体を無線により返送する。

【0032】また、後者の場合、図5に示すように、32ビットのユニークID全体を入場者個人のIDとして用い、サーバ25は、同じグループに属する入場者のユニークIDを1つのグループIDと関連付けて、データベース26に格納する。図6は、このときデータベース26に格納されるテーブルの例を示している。このデータキャリア11は、外部からの電波による問合せに対して、受け取ったID信号とデータキャリア内のユニークIDが一致すると、そのユニークIDを無線により返送する。

【0033】グループIDをデータキャリア11に書き込む方法では、新たな入場者に応じてグループIDを書き換える必要がある。このため、リード/ライト可能なデータキャリアを用いなければならない。これに対して、グループIDをデータベース26に保存する方法では、データキャリア11のユニークIDを変更する必要がない。このため、リードオンリーのデータキャリアを用いてもよく、これによりコストを削減することができる。

【0034】今、図2において、入場者A、Bが同じグループに属し、BがAの所在位置を探す必要が生じたものとする。この場合、探索者Bは、所持するデータキャリア11を端末13のアンテナ12に近づけることにより、非接触で、データキャリア11のIDを端末13に入力する。アンテナ12は、データキャリア11を検知するセンサの役割と、そこに記録されたデータを読み取るリーダの役割とを果たしている。また、ここでは、図4のタイプのユニークIDを用いているものとする。

【0035】次に、入力されたユニークIDのうちパーソナルID部のビットをすべて0とし、グループID部のみをそのまま残したユニークIDが、基地局15より施設内に無線で放送される。被探索者Aの所持するデータキャリア11は、自分の属するグループのグループIDの放送を検出すると、データキャリア11に記録されているユニークIDを最寄りの基地局15に返信する。これにより、基地局15は、データキャリア11がグループIDを受信したこと認識する。

【0036】被探索者AのユニークIDを受信した基

局15は、そのID情報を基地局15の基地局IDとともにネットワーク19上に流す。端末13の画面上では、ユニークIDを受信した基地局の基地局IDから一意に決まるエリアを、被探索者Aの所在位置として表示する。これにより、探索者Bは、施設内のAの現在位置を、速やかに認識することができる。

【0037】このような探索方法によれば、実際には、探索者を含むグループの構成員すべての所在位置が探索されて、表示されることになる。例えば、入場者A、B、C、Dが1つのグループを構成しているものとし、それらのパーソナルIDをそれぞれ1、2、3、4とし、グループIDを1とする。この場合、A、B、C、DのユニークIDは、それぞれ11、12、13、14となる。

【0038】そして、B、C、Dが同じ場所にいるときに、BがAの所在を端末13に問合せると、図7に示すように、B、C、DのユニークIDである12、13、14が施設内の同じエリアに表示され、AのユニークIDである11のみが、異なるエリアに表示される。こうして、Bは、Aの所在を確認することができる。

【0039】また、図5のタイプのユニークIDを用い、A、B、C、DのユニークIDをそれぞれ1、2、3、4とした場合は、同様にして、図8のような画面が表示される。この場合も、B、C、DのユニークIDである2、3、4が施設内の同じエリアに表示され、AのユニークIDである1のみが、異なるエリアに表示される。

【0040】次に、図9から図14までを参照しながら、グループIDをデータキャリア11に書き込む場合のシステムの動作を詳細に説明する。

【0041】図9は、図3の端末装置21による発券処理のフローチャートである。発券時には、まず、オペレータがグループの人数Nをクライアント24に入力し(ステップS1)、クライアント24は、N人分のユニークIDの発行をサーバ25に依頼する(ステップS2)。そして、サーバ25からIDが発行されたかどうかを判定し(ステップS3)、発行されるまで判定を繰り返す。

【0042】このとき、サーバ25は、グループID部が同じで、パーソナルID部のみがそれぞれ異なるN個のユニークIDを発行する。IDが発行されると、オペレータは、それらを順次N個のデータキャリア11に書き込み(ステップS4)、処理を終了する。

【0043】次に、図10は、データキャリア11の動作フローチャートである。データキャリア11は、常に、外部から信号を受信したかどうかを監視しており(ステップS11)、信号を受信すると、それがデータキャリア11内に記録されているIDを問合せるための番号(ID問合せ番号)かどうかを判定する(ステップS12)。ここで、ID問合せ番号とは、例えば32ビ

ットがすべて0のように、あらかじめ決められた特定のユニークIDを意味し、図2の端末13が探索者Bのデータキャリア11のIDを問合せる際に、アンテナ12から送信される。

【0044】受信信号がID問合せ番号であれば、データキャリア11は、保持しているユニークIDを送信して(ステップS13)、ステップS11の動作に戻る。また、それがID問合せ番号でなければ、次に、受信したID信号のグループID部とデータキャリア11自身のグループID部が一致するかどうかを判定する(ステップS14)。それらが一致すれば、保持しているユニークIDを送信して(ステップS13)、ステップS11の動作に戻り、一致しなければ、ユニークIDを送信しない。

【0045】図10の動作によれば、データキャリア11は、ID問合せ番号またはそのデータキャリアが属するグループのグループIDを受信した場合にのみ、ユニークIDを送信する。したがって、基地局15が他のグループのグループIDを放送しているときは、それに応答しない。このように、データキャリア11は、探索の必要が生じない限り発信することはないので、データキャリア11の小電力化および小型化を図ることができる。

【0046】次に、図11および図12は、図2の端末13および基地局15による探索処理のフローチャートである。端末13は、まず、被探索者の呼び出し回数を表す制御変数Tを0とおき(図11、ステップS21)、アンテナ12からの信号に基づいて、探索者がデータキャリア11を近づけたかどうかを判定する(ステップS22)。そして、データキャリア11が検知されない場合は、判定を繰り返す。

【0047】データキャリア11を検知すると、アンテナ12を介して、上述のID問合せ番号を送信し(ステップS23)、探索者のデータキャリア11からユニークIDを受信したかどうかを判定する(ステップS24)。そして、ユニークIDを受信していない場合は、判定を繰り返す。

【0048】ユニークIDを受信すると、探索者からグループ員の所在を問合せられたものとみなす。そして、そのパーソナルID部を0にして、グループID部のみを残したユニークIDを生成し(ステップS25)、それを各基地局15から送信させる(ステップS26)。

【0049】各基地局15は、半径数十メートル程度の無線エリア(基地局エリア)内のデータキャリア11と交信することができる。そして、そのエリア内に、送信したグループIDと同じグループIDを持つデータキャリア11があれば、そのデータキャリア11からユニークIDを受信する。

【0050】次に、端末13は、すべての基地局15が探索結果を返したかどうかを判定し(ステップS2

7)、結果を返していない基地局15があれば、判定を繰り返す。ここで、各基地局15は、その基地局IDとともに探索結果を端末13に返す。そして、すべての基地局15が探索結果を返すと、端末13は、いずれかの基地局15で被探索者のデータキャリア11からユニークIDを受信したかどうかを判定する(ステップS28)。

【0051】探索者のユニークIDは既に分かっているので、例えば、いずれかの基地局15がそれとは異なるユニークIDを受信していれば、被探索者のユニークIDを受信したものと判定される。いずれの基地局15も被探索者のユニークIDを受信していないければ、次に、Tをあらかじめ決められた設定値T0と比較する(ステップS29)。そして、TがT0以下であれば、T=T+1とおき(ステップS30)、ステップS26で被探索者の再呼び出しを行う。

【0052】そして、ステップS29でTがT0を越えると、「探索エリア内では発見できませんでした。」というメッセージを表示して(ステップS31)、処理を終了する。ここで、探索エリアとは、すべての基地局15によりカバーされる領域を意味する。

【0053】いずれかの基地局15で被探索者のユニークIDを受信した場合、次に、複数の基地局がユニークIDを受信しているかどうかを判定する(図12、ステップS32)。ユニークIDを受信した基地局15が1つだけのときは、その基地局15がカバーする基地局エリアと、受信したユニークIDとを表示して(ステップS33)、処理を終了する。各基地局15の基地局エリアの情報は、あらかじめその基地局IDと関連付けられて、端末13に格納されている。

【0054】また、ユニークIDを受信した基地局15が複数ある場合は、次に、2つ以上の基地局15が同じユニークIDを受信しているかどうかを判定する(ステップS34)。1つのユニークIDを2つ以上の基地局15が受信していない場合は、各基地局15の基地局エリアと、受信したユニークIDとを表示して(ステップS35)、処理を終了する。また、1つのユニークIDを2つ以上の基地局15が受信している場合は、それらの基地局15の基地局エリアの重複部分と、そのユニークIDとを表示して(ステップS36)、処理を終了する。

【0055】例えば、施設内の各基地局エリアは、図13に円で示されるように、隣接する基地局エリアが互いに重複するように配置され、基地局からの電波が施設内の全領域をカバーするようになっている。

【0056】被探索者Aが基地局エリア31を検出範囲とする基地局で検出されたとき、Aはエリア31の中に入ることが分かる。また、同時に、基地局エリア32を検出範囲とする基地局でもAが検出された場合、Aの位置はエリア31とエリア32の両方に重複するエリア3

3の中に限定される。そこで、この重複部分33が、探索結果として画面に表示される。

【0057】同様にして、検出する基地局の数が増えるほど、被探索者の所在エリアが限定され、その検出精度は高まる。図14の場合は、基地局エリア31、32、34をそれぞれ検出範囲とする3つの基地局でAが検出され、それらのエリアの重複部分であるエリア35が探索結果として表示される。

【0058】次に、図15から図18までを参照しながら、グループIDをデータキャリア11に書き込みますに、サーバ25で管理する場合のシステムの動作を詳細に説明する。

【0059】図15は、図3の端末装置21による発券処理のフローチャートである。発券時には、まず、クライアント24は、処理済の人数を表す制御変数mを0とおき(ステップS41)、オペレータは、グループの人数Nをクライアント24に入力した後(ステップS42)、データキャリア11のユニークIDをアンテナ22からクライアント24に入力する(ステップS43)。このとき、mの値は1だけインクリメントされる。

【0060】次に、クライアント24は、mとNを比較して、グループとして登録すべきすべてのデータキャリア11のユニークIDが入力されたかどうかを判定する(ステップS44)。そして、mがNより小さければ、次のデータキャリア11のユニークIDの入力を求めるメッセージを表示し、ステップS43の処理を繰り返す。

【0061】そして、mがNに達すると、クライアント24は、入力されたN個のユニークIDのグループ登録をサーバ25に依頼する(ステップS45)。そして、サーバ25から登録完了が通知されたかどうかを判定し(ステップS46)、それが完了するまで判定を繰り返す。

【0062】このとき、サーバ25は、クライアント24から受け取ったN個のユニークIDを、図6に示したように、1つのグループIDと関連付けてデータベース26に格納し、データキャリア11のグループ登録を行う。そして、グループ登録完了の通知をクライアント24に送り、それを受けて、クライアント24は処理を終了する。

【0063】次に、図16は、データキャリア11の動作フローチャートである。データキャリア11は、常に、外部から信号を受信したかどうかを監視しており(ステップS51)、信号を受信すると、それが前述のID問合せ番号かどうかを判定する(ステップS52)。

【0064】受信信号がID問合せ番号であれば、データキャリア11は、保持しているユニークIDを送信して(ステップS53)、ステップS51の動作に戻る。

また、それがID問合せ番号でなければ、次に、受信したID信号とデータキャリア11自身のユニークIDが一致するかどうかを判定する(ステップS54)。それらが一致すれば、保持しているユニークIDを送信して(ステップS53)、ステップS51の動作に戻り、一致しなければ、ユニークIDを送信しない。

【0065】図16の動作によれば、データキャリア11は、ID問合せ番号またはそのデータキャリアが保持するユニークIDを受信した場合にのみ、ユニークIDを送信する。したがって、基地局15が他のユニークIDを放送しているときは、それに応答しない。

【0066】次に、図17および図18は、図2の端末13および基地局15による探索処理のフローチャートである。端末13は、まず、アンテナ12からの信号に基づいて、探索者がデータキャリア11を近づけたかどうかを判定する(図17、ステップS60)。そして、データキャリア11が検知されない場合は、判定を繰り返す。

【0067】データキャリア11を検知すると、アンテナ12を介して、上述のID問合せ番号を送信し(ステップS61)、探索者のデータキャリア11からユニークIDを受信したかどうかを判定する(ステップS62)。そして、ユニークIDを受信していない場合は、判定を繰り返す。

【0068】ユニークIDを受信すると、探索者からグループ員の所在を問合せられたものとみなす。そして、探索者のユニークIDを検索キーとしてデータベース26を検索し、探索者のグループの人数Nと、そのグループの全構成員のユニークIDとを取得する(ステップS63)。ここで、n番目の構成員のユニークIDをID(n)(n=1, 2, 3, ..., N)とすると、ID(n)は端末13内のバッファA(n)に格納される。

【0069】次に、端末13は、バッファA(n)を識別する制御変数nを1とおき(ステップS64)、呼び出し回数を表す制御変数Tを0とおいて(ステップS65)、A(n)に保持されているユニークIDを各基地局15から送信させる(ステップS66)。

【0070】各基地局15は、その基地局エリア内に、送信したユニークIDと同じIDを持つデータキャリア11があれば、そのデータキャリア11からユニークIDを受信する。

【0071】次に、端末13は、すべての基地局15が探索結果を返したかどうかを判定し(ステップS67)、結果を返していない基地局15があれば、判定を繰り返す。ここで、各基地局15は、その基地局IDとともに探索結果を端末13に返す。そして、すべての基地局15が探索結果を返すと、端末13は、いずれかの基地局15でA(n)と同じユニークIDを受信したかどうかを判定する(ステップS68)。

【0072】いずれの基地局15もそのユニークIDを

受信していなければ、次に、Tをあらかじめ決められた設定値T0と比較する(ステップS69)。そして、TがT0以下であれば、T=T+1とおき(ステップS70)、ステップS66で被探索者の再呼び出しを行う。

【0073】いずれかの基地局15でユニークIDを受信した場合、受信したすべての基地局15の基地局IDをバッファB(n)に書き込み(ステップS71)、nとNを比較して、すべてのA(n)のユニークIDを放送したかどうかを判定する(図18、ステップS73)。nがNより小さければ、nの値を1だけインクリメントし(ステップS74)、ステップS65以降の処理を繰り返す。ステップS69でTがT0を越えると、バッファB(n)に0を書き込み(ステップS72)、ステップS73以降の処理を繰り返す。

【0074】ステップS73でnがNに達すると、次に、nを再び1とおき(ステップS75)、バッファB(n)に複数の基地局IDが書き込まれているかどうかを判定する(ステップS76)。B(n)に複数の基地局IDがあれば、それらの基地局がID(n)を受信したものとみなし、それらの基地局の基地局エリアの重複部分と、ID(n)とを表示する(ステップS77)。各基地局の基地局エリアの情報は、あらかじめその基地局IDと関連付けられて、端末13に格納されている。

【0075】そして、nとNを比較して、すべてのID(n)を表示したかどうかを判定する(ステップS78)。nがNより小さければ、nの値を1だけインクリメントし(ステップS79)、ステップS76以降の処理を繰り返す。

【0076】ステップS76でB(n)に複数の基地局IDがなければ、次に、B(n)に0が書き込まれているかどうかを判定する(ステップS80)。B(n)の値が0でなく、基地局IDが1つだけ書き込まれている場合は、その基地局の基地局エリアと、ID(n)とを表示して(ステップS81)、ステップS78以降の処理を行う。

【0077】また、B(n)の値が0であれば、「ID(n)は発見できませんでした。」というメッセージを表示して(ステップS82)、ステップS78以降の処理を行う。そして、ステップS78でnがNに達すると、処理を終了する。

【0078】以上説明した実施形態の応用例として、端末13の画面に探索されたグループ員の氏名を表示することも可能である。例えば、図4のデータキャリア11を用いた場合、発券時に、オペレータが各データキャリア11の所持者の氏名を図3のクライアント24に入力する。そして、サーバ25は、図19に示すように、各グループ員の氏名とグループIDおよびパーソナルIDを関連付けたテーブルを生成し、データベース26に格納しておく。

【0079】探索時には、図2の端末13は、図12の

ステップS33、S35、およびS36においてデータベース26を検索し、受信したユニークIDの代わりに、対応する氏名を表示する。図7に示した探索結果の場合は、図19のテーブルに格納された氏名を用いることで、図20のような画面が表示される。これにより、探索者Bは、被探索者Aの位置をより明確に認識することができる。ここで、A、B、C、Dは、それぞれ、11、12、13、14をユニークIDとするグループ員の氏名を表す。

10 【0080】また、他の応用例として、端末13の画面に探索されたグループ員の画像を表示することも可能である。この場合、発券時に、入場者の承諾を得て、図3のカメラ27がその顔写真などを撮影し、クライアント24に入力する。そして、サーバ25は、図21に示すように、各グループ員の画像41、42、43、44をデータベース26に格納する。また、それらの画像の格納領域を指すポインタとグループIDおよびパーソナルIDを関連付けたテーブルを生成し、それをデータベース26に格納しておく。

20 【0081】探索時には、図2の端末13は、図12のステップS33、S35、およびS36においてデータベース26を検索し、受信したユニークIDの代わりに、対応する画像を表示する。図7に示した探索結果の場合は、図21のテーブルに格納されたポインタを用いることで、図22のような画面が表示される。これにより、探索者Bは、被探索者Aの位置をより明確に認識することができる。ここで、画像41、42、43、44は、それぞれ、11、12、13、14をユニークIDとするグループ員の顔写真を表す。

30 【0082】探索結果の画面に画像を表示する方法によれば、オペレータが氏名を入力する必要がないので、氏名を表示する方法よりも発券処理が効率化され、多人数のグループにも速やかにデータキャリア11を発行することができる。また、図5のデータキャリア11を用いた場合も、図19や図21と同様のテーブルを生成することで、氏名や画像を表示することができる。

【0083】また、本実施形態において、データキャリア11のグループIDを書き換えたり、データベース26のテーブルを書き換えたりすることで、後から遅れてきた人を既に入場した人と同じグループに加えることもできる。さらに、アトラクションの使用料金など、施設内で発生した費用をグループID毎に課金して、退場時にグループ単位で清算することも可能である。

40 【0084】図2の端末13、図3のクライアント24、およびサーバ25としては、例えば、図23に示すような情報処理装置(コンピュータ)が用いられる。図23の情報処理装置は、CPU51、メモリ52、入力装置53、出力装置54、外部記憶装置55、媒体駆動装置56、およびネットワーク接続装置57を備え、それらはバス58により互いに接続されている。

【0085】メモリ52には、処理に用いられるプログラムとデータが格納される。メモリ52としては、例えばROM (read only memory)、RAM (random access memory) 等が用いられる。CPU51は、メモリ52を利用してプログラムを実行することにより、上述したような探索システムの各処理を行う。

【0086】入力装置53は、例えば、キーボード、ポインティングデバイス、タッチパネル等であり、必要な指示や情報の入力に用いられる。出力装置54は、例えば、ディスプレイやプリンタ等であり、探索結果やオペレータへの問い合わせ事項を出力する。

【0087】外部記憶装置55は、例えば、磁気ディスク装置、光ディスク装置、光磁気ディスク (magneto-optical disk) 装置等である。この外部記憶装置55に、上述のプログラムとデータを保存しておき、必要に応じて、それらをメモリ52にロードして使用することもできる。

【0088】媒体駆動装置56は、可搬記録媒体59を駆動し、その記録内容にアクセスする。可搬記録媒体59としては、メモリカード、フロッピー (登録商標) ディスク、CD-ROM (compact disk read only memory)、光ディスク、光磁気ディスク等、任意のコンピュータ読み取り可能な記録媒体が用いられる。この可搬記録媒体59に上述のプログラムとデータを格納しておき、必要に応じて、それらをメモリ52にロードして使用することもできる。

【0089】ネットワーク接続装置57は、LAN (local area network) 等の任意のネットワーク (回線) 19を介して外部の装置と通信する。これにより、必要に応じて、上述のプログラムとデータを外部の装置から受け取り、それらをメモリ52にロードして使用することもできる。

【0090】図24は、図23の情報処理装置にプログラムとデータを供給することのできるコンピュータ読み取り可能な記録媒体を示している。可搬記録媒体59や外部のデータベース60に保存されたプログラムとデータは、メモリ52にロードされる。そして、CPU51は、そのデータを用いてそのプログラムを実行し、必要な処理を行う。また、図23の外部記憶装置55や図24のデータベース60は、例えば、図3のデータベース26として用いられる。

【0091】また、図25は、データキャリア11の構成例を示している。図25のデータキャリアは、アンテナ61、制御部62、記憶部63、および電源部64を含む。アンテナ61は、外部のアンテナとの間で信号を送受信し、記憶部63は、図4または図5のようなユニクIDを記憶する。制御部62は、アンテナ61による通信を制御し、記憶部63に対するデータのリード/ライトを行う。また、電源部64は、アンテナ61、制御部62、および記憶部63に電源を供給する。

【0092】

【発明の効果】本発明によれば、アミューズメントパークなどの施設の入場者をグループ単位で管理することで、探索者と被探索者とがあらかじめ関連付けられる。同じグループの構成員の探索時には、システムのセンサ部分にデータキャリアを近づけるだけでよく、操作が簡単化される。また、多人数のグループの場合でも、比較的簡単な操作で発券処理を済ませることができる。

【図面の簡単な説明】

【図1】本発明の探索システムの原理図である。

【図2】探索システムの構成図である。

【図3】発券システムの構成図である。

【図4】第1のデータキャリアを示す図である。

【図5】第2のデータキャリアを示す図である。

【図6】第1のテーブルを示す図である。

【図7】第1の表示画面を示す図である。

【図8】第2の表示画面を示す図である。

【図9】第1の発券処理のフローチャートである。

20 【図10】第1のデータキャリアの動作フローチャートである。

【図11】第1の探索処理のフローチャート (その1) である。

【図12】第1の探索処理のフローチャート (その2) である。

【図13】第1の重複エリアを示す図である。

【図14】第2の重複エリアを示す図である。

【図15】第2の発券処理のフローチャートである。

【図16】第2のデータキャリアの動作フローチャートである。

30 【図17】第2の探索処理のフローチャート (その1) である。

【図18】第2の探索処理のフローチャート (その2) である。

【図19】第2のテーブルを示す図である。

【図20】第3の表示画面を示す図である。

【図21】第3のテーブルを示す図である。

【図22】第4の表示画面を示す図である。

【図23】情報処理装置の構成図である。

【図24】記録媒体を示す図である。

40 【図25】データキャリアの構成図である。

【符号の説明】

1 探索手段

2 記憶手段

11 データキャリア

12、16、22、61 アンテナ

13 端末

14 信号変換装置

15 基地局

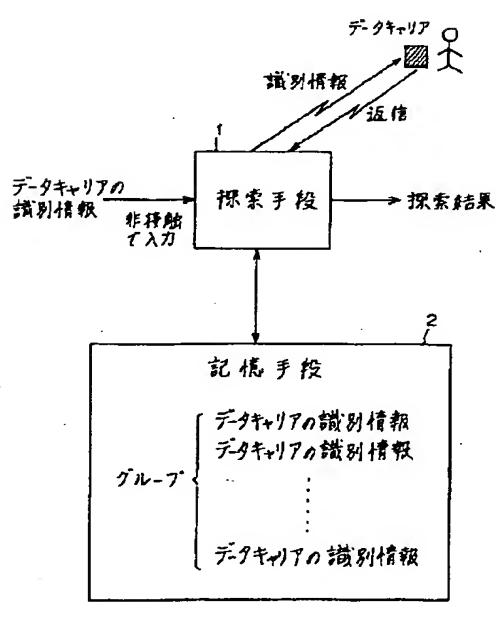
17 無線モデム

50 18 電力線モデム

19 ネットワーク
 20 電力線
 21 端末装置
 23、62 制御部
 24 クライアントコンピュータ
 25 サーバコンピュータ
 26、60 データベース
 27 カメラ
 31、32、34 基地局エリア
 33、35 重複エリア
 41、42、43、44 画像

【図1】

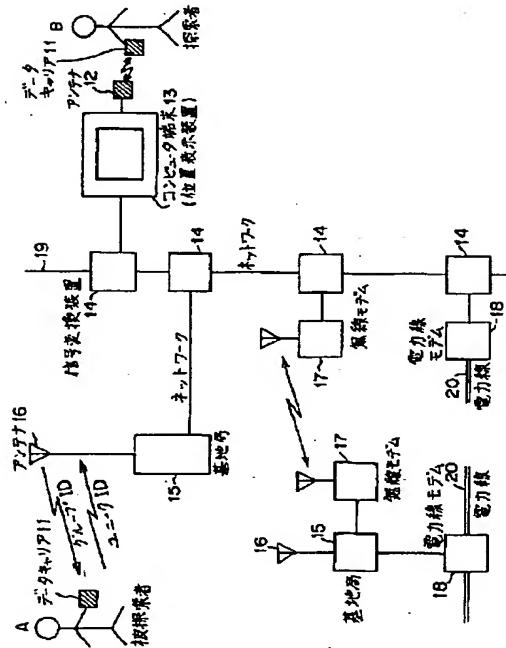
本発明の原理図



* 51 CPU
 52 メモリ
 53 入力装置
 54 出力装置
 55 外部記憶装置
 56 媒体駆動装置
 57 ネットワーク接続装置
 58 バス
 59 可搬記録媒体
 10 63 記憶部
 * 64 電源部

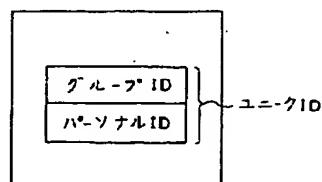
【図2】

検索システムの構成図



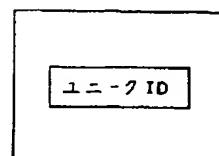
【図4】

第1のデータキャリアを示す図



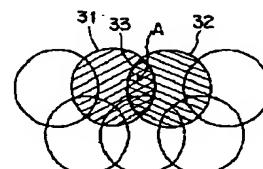
【図5】

第2のデータキャリアを示す図

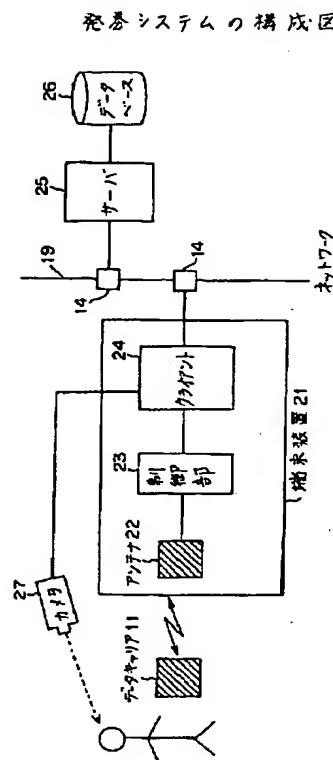


【図13】

第1の重複エリアを示す図



【図3】

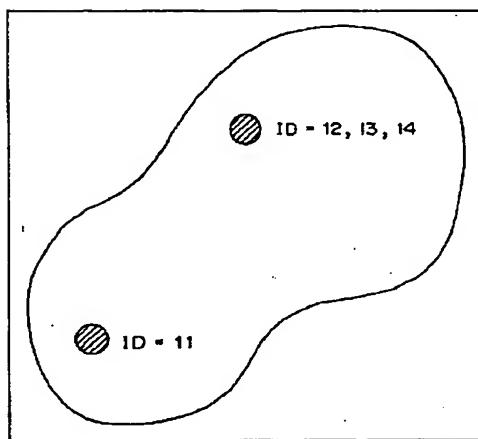


【図6】

グループID	ユニークID
1	1 2 3 ...
2	1 2 3 ...
N	1 2 3 ...

【図7】

第1の表示画面を示す図



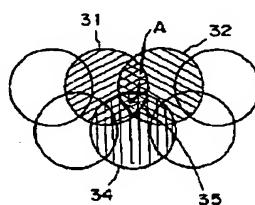
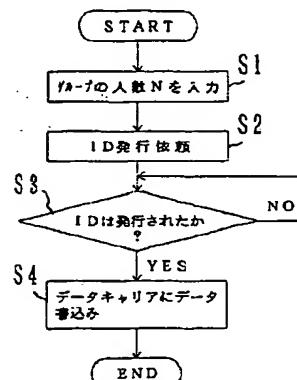
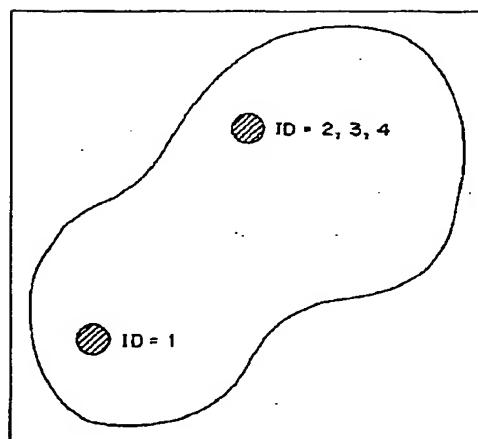
【図9】

【図14】

第1の発券処理のフローチャート 第2の重複エリアを示す図

【図8】

第2の表示画面を示す図



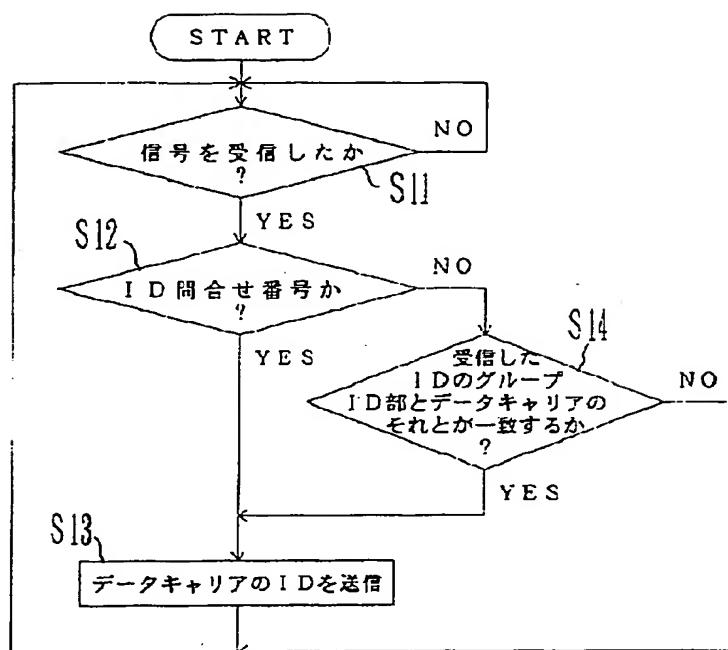
【図19】

第2のテーブルを示す図

グループID	バーサイナルID	名前
1	1 2 3 4	A B C D
2	1 2 3 ...	AA BB CC ...

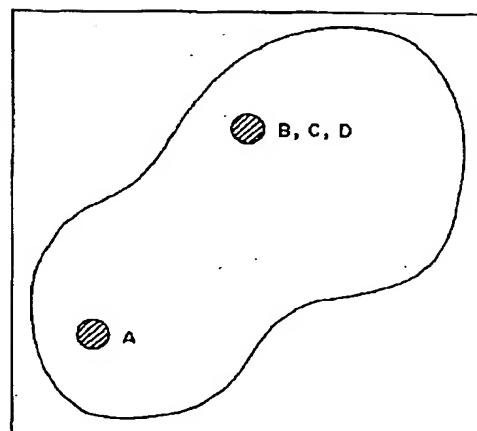
【図10】

第1のデータキャリアの動作フローチャート



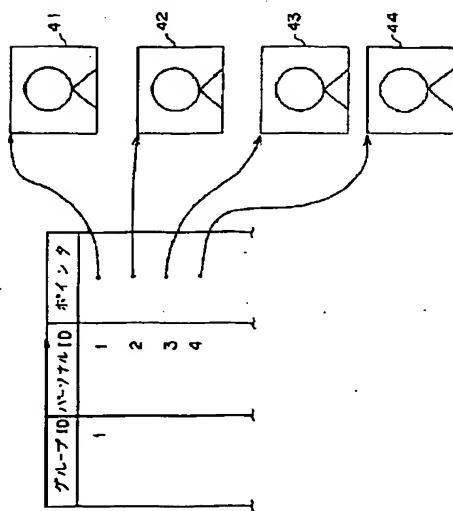
【図20】

第3の表示画面を示す図



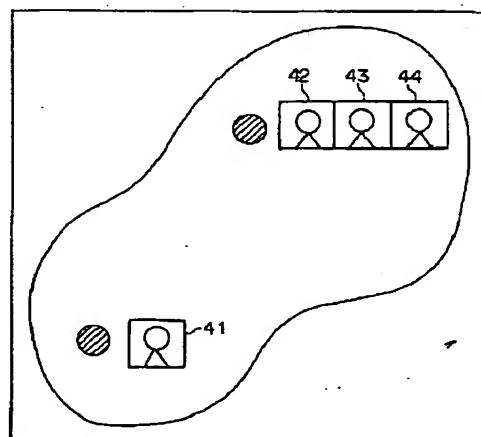
【図21】

第3のテーブルを示す図



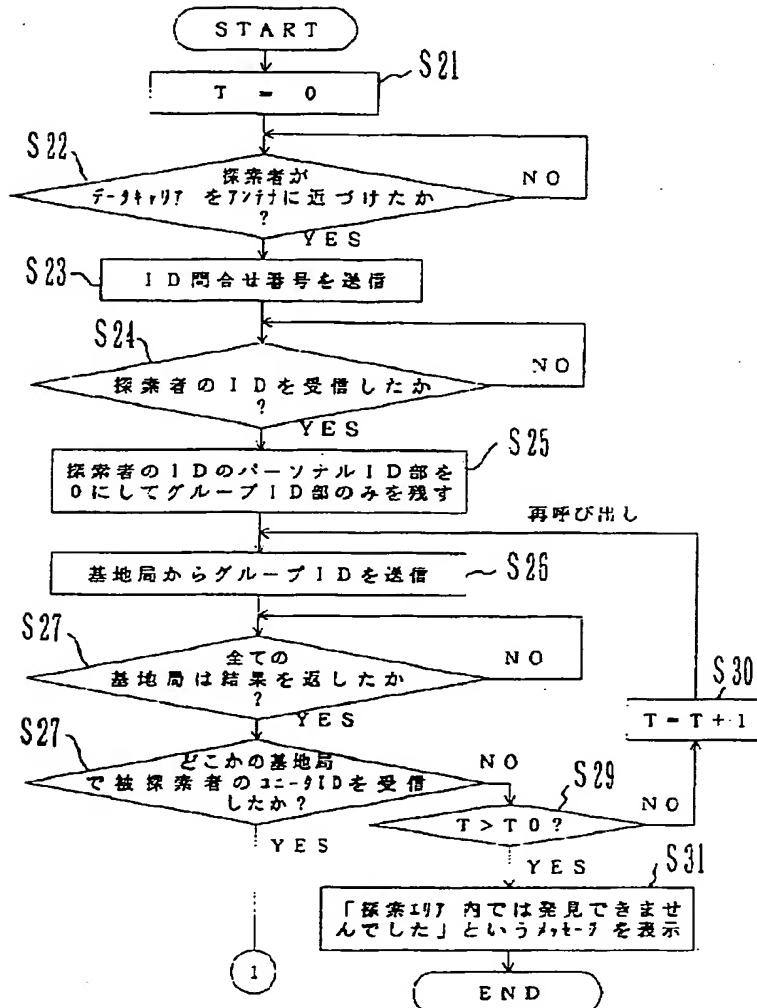
【図22】

第4の表示画面を示す図



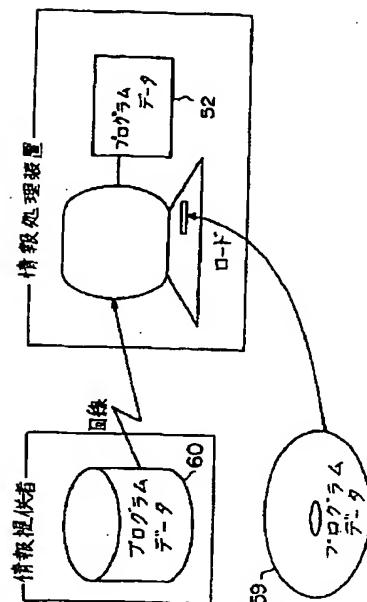
【図11】

第1の探索処理のフロー・チャート(その1)



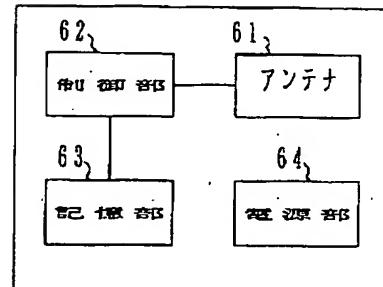
【図24】

記録媒体を示す図



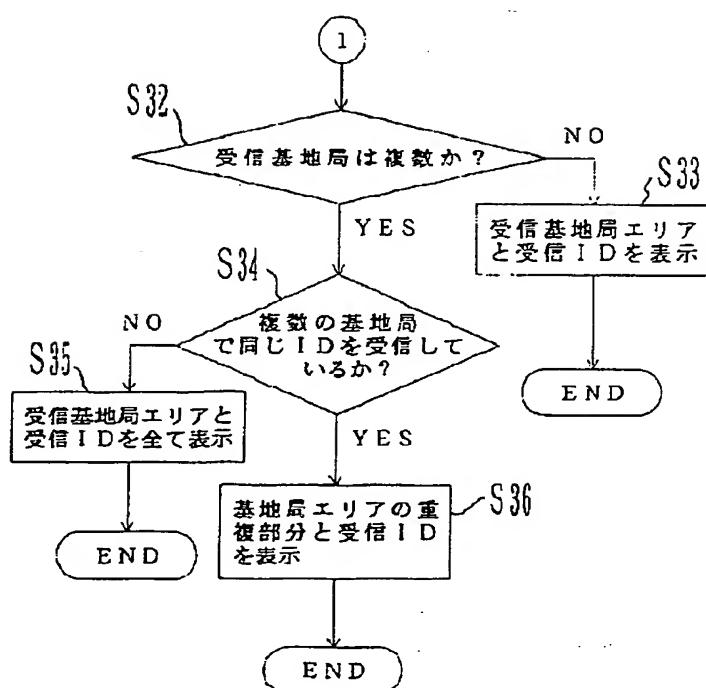
【図25】

データキャリアの構成図



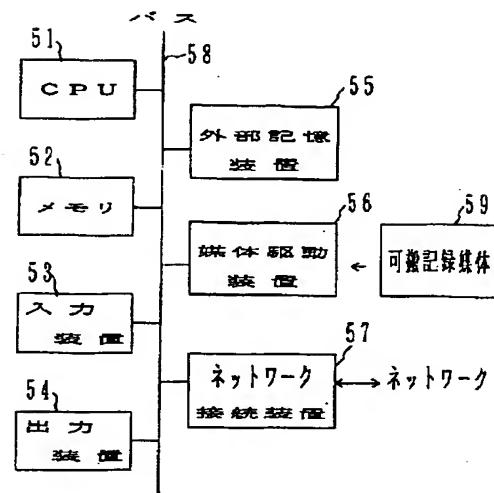
【図12】

第1の探索処理のフロー・チャート(その2)



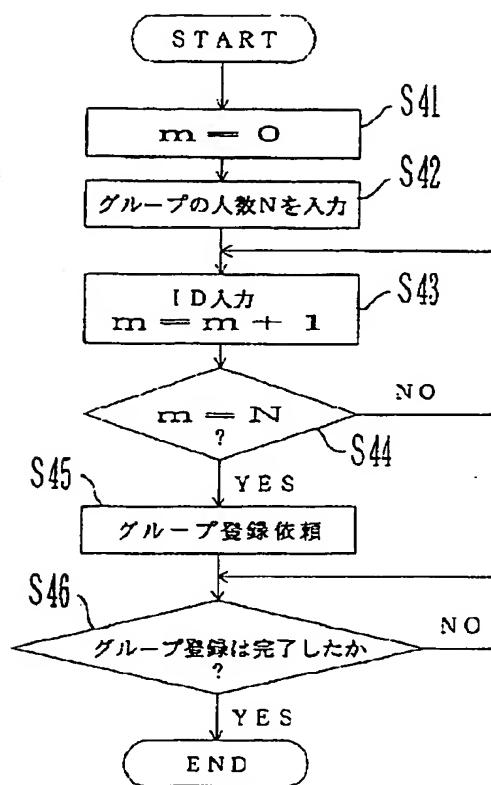
【図23】

情報処理装置の構成図



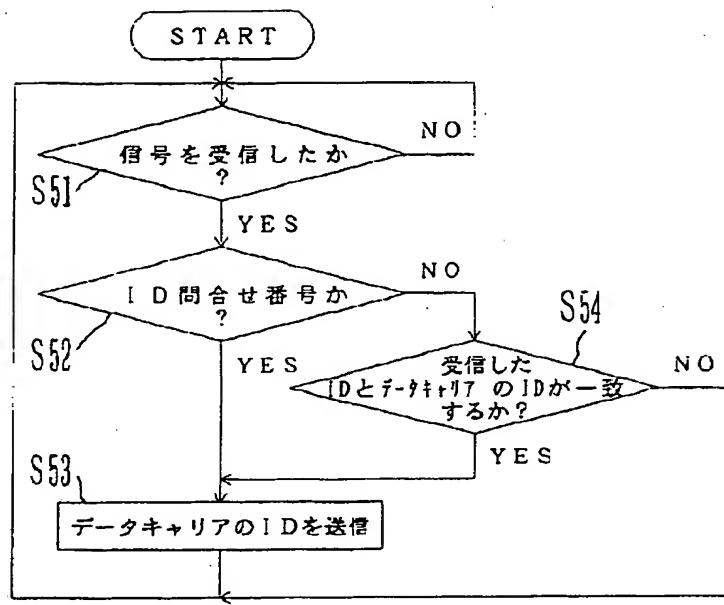
【図15】

第2の発券処理のフローチャート



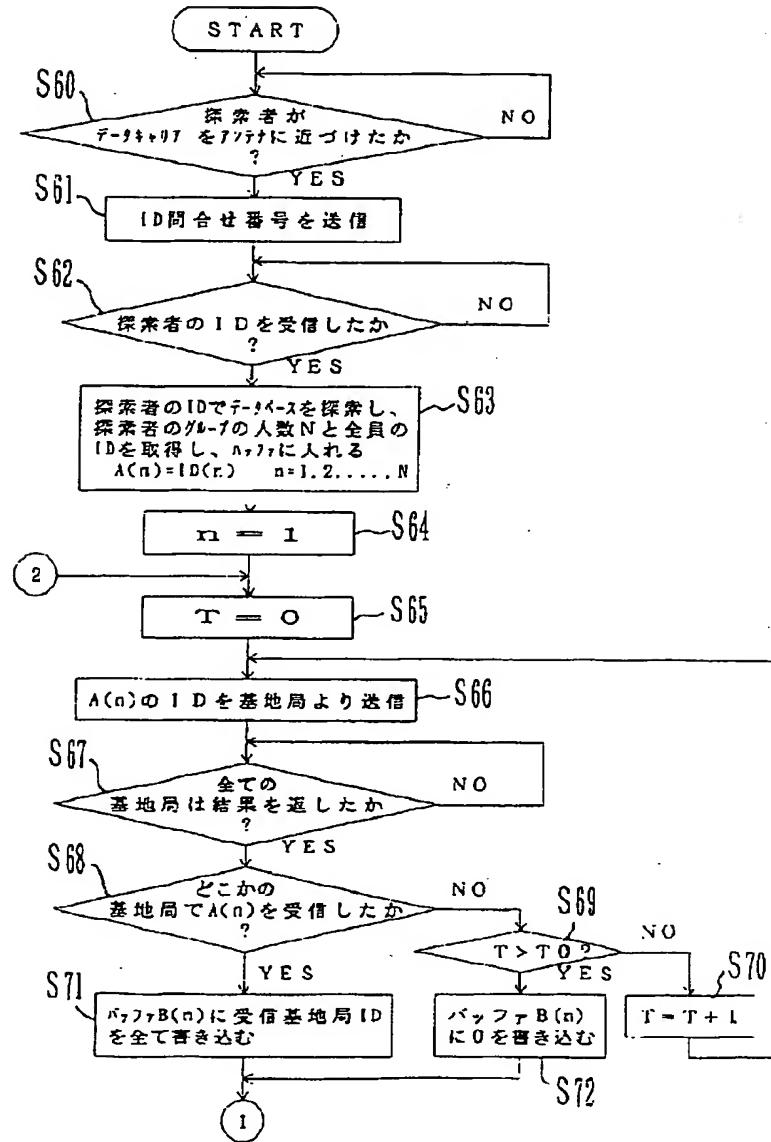
[図16]

第2のデータキャリアの動作フローチャート



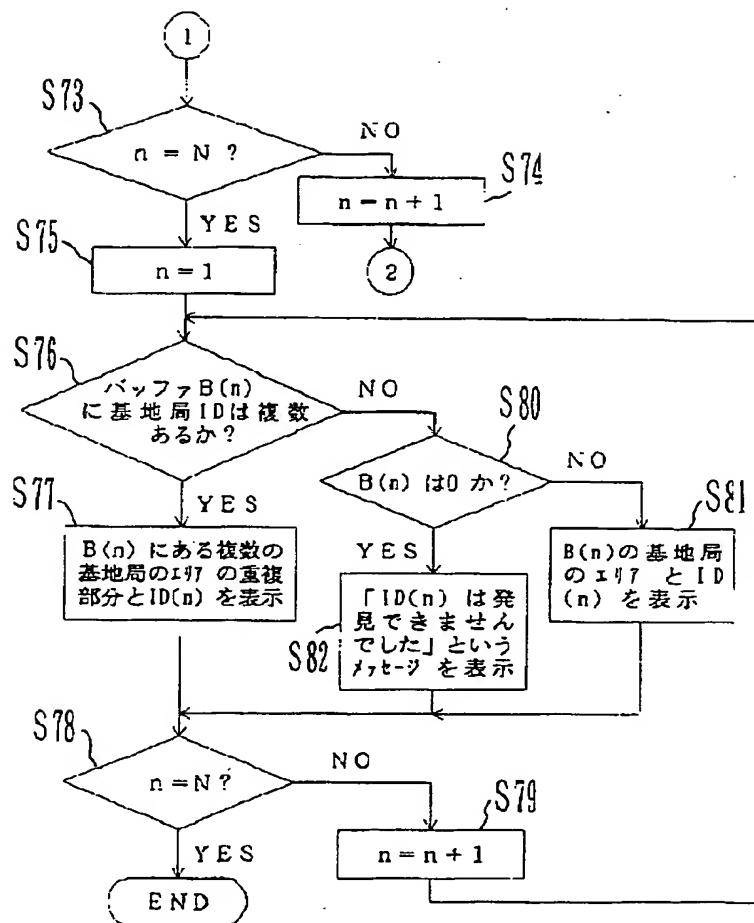
[図17]

第2の探索処理のフローチャート(その1)



【図18】

第2の探索処理のフローチャート(その2)



フロントページの続き

(51)Int.Cl.
 G 06 K 19/00
 G 08 G 1/13
 G 09 B 29/00
 H 04 Q 7/34

識別記号

F I
 G 09 B 29/00
 G 06 K 19/00
 H 04 B 7/26

テーマード(参考)
 Z 5K067
 H
 Q
 106 D

F ターム(参考) 2C005 MB01 MB09 NA08 NA09 SA03
SA25 TA22
2C032 HB21 HD03
5B035 AA00 BB09 BC00 CA23
5B058 CA17 KA40 YA20
5H180 AA21 BB04 BB12 CC04 CC12
5K067 AA34 BB34 CC13 DD17 EE02
EE10 EE32 JJ53 KK01 KK15
LL05